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GLOBAL DATA MONITORING REPORT

December, 1997

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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Bracknell. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Bracknell in time for inclusion into the appropriate analysis. The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background field). Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

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2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1-2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Bracknell and assimilated into model runs. Only data from the main hours of 00 UTC, 06 UTC, 12UTC and 18 UTC are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At RSMC Bracknell, for synoptic stations at or below a height of 500 metres, reported mean sea-level pressure is used in the statistics. If this is unavailable the mean sea-level pressure is calculated from the reported station-level pressure and temperature.

For synoptic stations above 500 metres, the mean sea-level pressure is calculated from the reported station-level pressure and temperature, or, if these are not available the height of a standard pressure-level (e.g.: 850 hPa or 700 hPa). If neither of these are available, the reported mean sea-level pressure is used.

Some stations vary their reporting practice according to the observation hour (e.g.: some stations in the CIS report both mean sea-level and station-level pressure at 00 & 12 UTC, but only mean sea-level pressure at 06 & 18 UTC). For monitoring purposes, reported mean sea-level pressure is stored separately from that calculated from station-level pressure or height of a standard pressure-level. Only statistics for the preferred method (see above) are presented in this report, and so for certain high-level stations, such as those from the CIS, approximately half of the number of observations actually received will appear in the statistics.

Aircraft observations

TABLE 4 contains a list of statistics calculated from data received from all airline carriers.

Figure 3 shows 10 degree lat/long box average numbers of aircraft reports (in AIREP/AMDAR code, including AIREPs, ACARs, AMDARs and ASDARs) received per day throughout the month at Bracknell and assimilated into model runs in the layer 70-500 hPa. Observations with a vector wind difference (compared with the model background field) of >60 m s^{-1} have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 4-7 show wind statistics for AIREP/ASDAR (in AIREP/AMDAR code, including AIREPs, ACARs, AMDARs and ASDARs) in the layer 70-500 hPa. Observations with a vector wind difference > 60 m s^{-1} have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure	Parameter
4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed (m s^{-1})
7	RMS observation-background vector (m s^{-1})

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Bracknell and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-27 show satellite mean observation-background temperature differences for NOAA-11 soundings at 500 km resolution and figures 28-30 show the same statistics for NOAA-14. Data are plotted where there are > 30 observations in a 10 degree lat/long box.

N.B. 500 km SATEMs are no longer assimilated into the UKMO global Unified Model. Both 500 km and 120 km SATEMs were replaced on 16th April 1996 by 120 km resolution temperature profiles produced locally from the radiances disseminated by NESDIS (from NOAA-11 and NOAA-14).

Figure	Layer (hPa)
25/28	850-1000
26/29	100-300
27/30	30-50

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Bracknell during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Bracknell in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Bracknell from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics (**Geopotential Height and Windspeed at 100 and 500 hPa**) for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

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Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 have been replaced by statistics for GOES-8 and GOES-9.
5. February 97 Monitoring statistics for Meteosat 5 have been replaced by statistics for Meteosat 6.
6. Sept 97 Monitoring statistics for NOAA-12 removed. Figures 25-27 now show data for NOAA-11

TABLE 1

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: BRACKNELL
MONTH: December, 1997

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for ships, fixed buoys and platforms.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Mean sea level pressure (hPa). :Wind speed (m s^{-1}). :Wind direction (Degrees).
Parameters monitored		
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. a positive bias indicates the observation is veered to the background.**
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:15 hPa (pressure) :25 m s^{-1} (vector wind)	

SELECTION CRITERIA	:NOBS	≥ 20 , and one or more of the following:	
	1.| bias|	≥ 4 hPa ≥ 5 m s^{-1} ≥ 30 degrees	(pressure), (wind speed), (direction).
	2.SD	≥ 6 hPa ≥ 80 degrees	(pressure), (direction).
	3.PGE	≥ 25	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE									
CYGR	ALL	MSLP	SUR	25	17	68	4.3	-7.7	8.8
C6FA6	ALL	MSLP	SUR	71	1	1	0.9	-6.6	6.7
DNHS	ALL	MSLP	SUR	27	0	0	1.1	-4.1	4.2
DOWVD2D	ALL	MSLP	SUR	45	0	0	3.2	4.8	5.8
ELSU8	ALL	MSLP	SUR	60	1	2	3.1	6.4	7.1
ELTE6	ALL	MSLP	SUR	28	0	0	1.4	-4.6	4.8
MVQN8	ALL	MSLP	SUR	77	1	1	1.1	12.1	12.2
NYCQ	ALL	MSLP	SUR	68	31	46	4.1	-6.1	7.4
PCBU	ALL	MSLP	SUR	32	26	81	7.6	11.2	13.5
UCAC	ALL	MSLP	SUR	24	0	0	1.3	5.5	5.7
UHLK	ALL	MSLP	SUR	28	0	0	2.3	-5.7	6.1
VOXZ	ALL	MSLP	SUR	35	27	77	3.8	-5.6	6.8
VTCN	ALL	MSLP	SUR	20	0	0	2.1	5.0	5.5
V2XO	ALL	MSLP	SUR	51	0	0	1.5	-4.8	5.1
V7AW8	ALL	MSLP	SUR	20	0	0	1.2	4.8	5.0
WDZB	ALL	MSLP	SUR	57	0	0	1.1	-5.6	5.7
YFFB	ALL	MSLP	SUR	20	2	10	2.2	5.2	5.7
3FDY6	ALL	MSLP	SUR	43	0	0	2.2	4.6	5.1
3FHT4	ALL	MSLP	SUR	25	11	44	1.5	-0.8	1.7
3FJJ3	ALL	MSLP	SUR	25	0	0	2.1	-5.7	6.1
3FKZ3	ALL	MSLP	SUR	54	0	0	2.0	4.1	4.6
3FTJ4	ALL	MSLP	SUR	20	0	0	0.8	11.2	11.2
3FZW	ALL	MSLP	SUR	24	0	0	0.9	4.5	4.6
9VIH	ALL	MSLP	SUR	24	0	0	1.1	-6.1	6.2
9VPK	ALL	MSLP	SUR	26	0	0	0.9	9.3	9.3
9VXB	ALL	MSLP	SUR	21	6	29	2.6	-0.2	2.6
9WCR3	ALL	MSLP	SUR	28	1	4	4.7	-4.2	6.3
WIND SPEED									
DUQM	ALL	SPEED	SUR	21	4	19	7.2	7.4	10.3
ELTT3	ALL	SPEED	SUR	24	0	0	3.7	5.0	6.2
OUEV	ALL	SPEED	SUR	21	0	0	5.8	11.0	12.4
PFRX	ALL	SPEED	SUR	49	0	0	6.4	5.2	8.3
PJOX	ALL	SPEED	SUR	80	1	1	5.5	6.4	8.5
S6CL	ALL	SPEED	SUR	21	0	0	3.4	5.1	6.1
VRVB9	ALL	SPEED	SUR	34	0	0	6.3	5.2	8.2
ZCAS6	ALL	SPEED	SUR	64	0	0	4.9	6.8	8.4
3ELC6	ALL	SPEED	SUR	26	2	8	5.9	7.1	9.2
3ETH4	ALL	SPEED	SUR	28	0	0	3.4	6.0	6.9
3FBK2	ALL	SPEED	SUR	35	1	3	5.0	5.2	7.2
9MCN8	ALL	SPEED	SUR	27	1	4	6.7	5.6	8.8
9WCR3	ALL	SPEED	SUR	28	1	4	4.9	5.3	7.2
WIND DIRECTION									
ZCBJ2	ALL	DIRN.	SUR	51	0	0	51.8	-30.8	60.3
3FSL4	ALL	DIRN.	SUR	24	0	0	88.3	-13.9	89.4
51010	ALL	DIRN.	SUR	65	0	0	29.8	-32.7	44.3
51302	ALL	DIRN.	SUR	32	0	0	96.9	-33.9	102.6
52010	ALL	DIRN.	SUR	27	0	0	94.8	-25.3	98.1
52317	ALL	DIRN.	SUR	41	0	0	44.4	-33.9	55.8
62107	ALL	DIRN.	SUR	32	4	13	101.6	-10.7	102.1

AVAILABILITY – SHIP/SYNOP – DECEMBER 1997

FIGURE 1

MAIN HOURS ONLY

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 18076

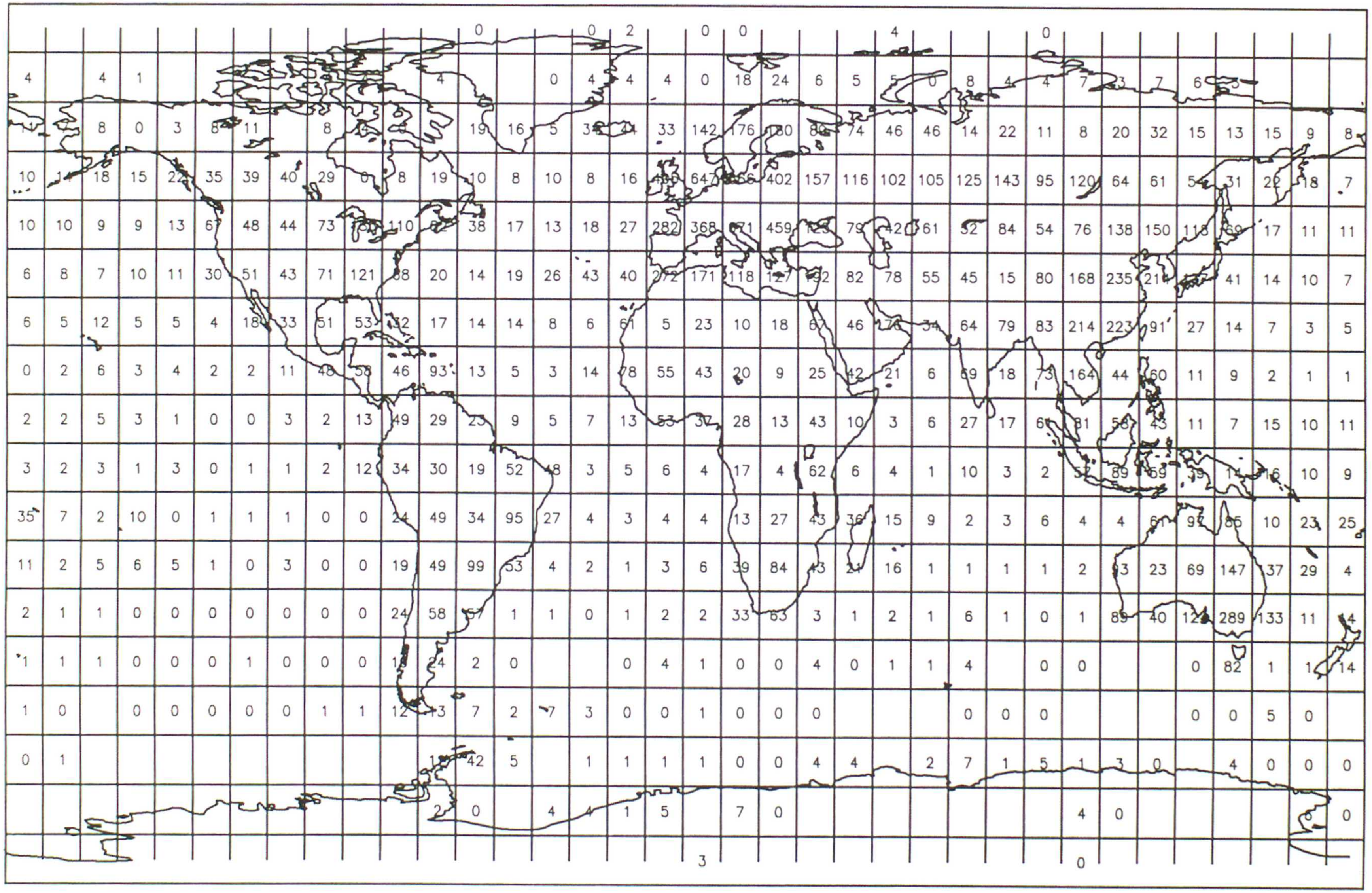


TABLE 2

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: BRACKNELL
MONTH: December, 1997

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from each unique identifier for drifting buoys.
Standard of comparison	:Background field from Bracknell global model.
Position	:Average latitude and longitude for period.
Observation times	:00, 06, 12, 18 UTC
Elements monitored	:Mean sea level pressure (hPa). :Wind speed (m s^{-1}). :Wind direction (degrees).

Parameters monitored		
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. a positive bias indicates the observation is veered to the background.**
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:15 hPa :25 m s^{-1}	(pressure) (vector wind)
SELECTION CRITERIA :	NOBS	≥ 20 , and one or more of the following:

1.| bias|	≥ 4 hPa	(pressure),
	≥ 5 m s^{-1}	(wind speed),
	≥ 30 degrees	(direction).
2.SD	≥ 6 hPa	(pressure),
	≥ 80 degrees	(direction).
3.PGE	≥ 25.	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
17536	-36.0	13.5	ALL	MSLP	SUR	22	20	91	0.3	-5.0	5.1
33953	-39.7	-6.5	ALL	MSLP	SUR	190	18	9	3.2	5.0	5.9
41523	13.6	-52.6	ALL	MSLP	SUR	226	2	1	2.9	7.8	8.3
46619	26.1	-131.8	ALL	MSLP	SUR	204	8	4	3.6	4.6	5.9
52539	18.2	122.9	ALL	MSLP	SUR	373	0	0	5.4	-4.4	7.0
54939	-42.4	-131.8	ALL	MSLP	SUR	222	27	12	6.7	-0.3	6.7
62673	58.4	-37.2	ALL	MSLP	SUR	234	84	36	1.3	-0.3	1.4
62674	58.4	-27.8	ALL	MSLP	SUR	229	85	37	1.5	-0.2	1.5
WIND SPEED											
52533	9.0	126.8	ALL	SPEED	SUR	39	0	0	1.8	-5.9	6.2
52534	13.0	132.8	ALL	SPEED	SUR	115	0	0	1.5	-5.2	5.4
WIND DIRECTION											
21531	38.1	163.5	ALL	DIRN.	SUR	208	0	0	80.5	17.8	82.4
23581	-6.3	67.1	ALL	DIRN.	SUR	128	0	0	90.8	33.7	96.9
23584	2.0	81.7	ALL	DIRN.	SUR	66	0	0	71.1	41.9	82.5
51997	18.2	-136.1	ALL	DIRN.	SUR	22	0	0	37.3	-37.3	52.8

AVAILABILITY – DRIFTER – DECEMBER 1997

FIGURE 2

MAIN HOURS ONLY
10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS
GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 5352

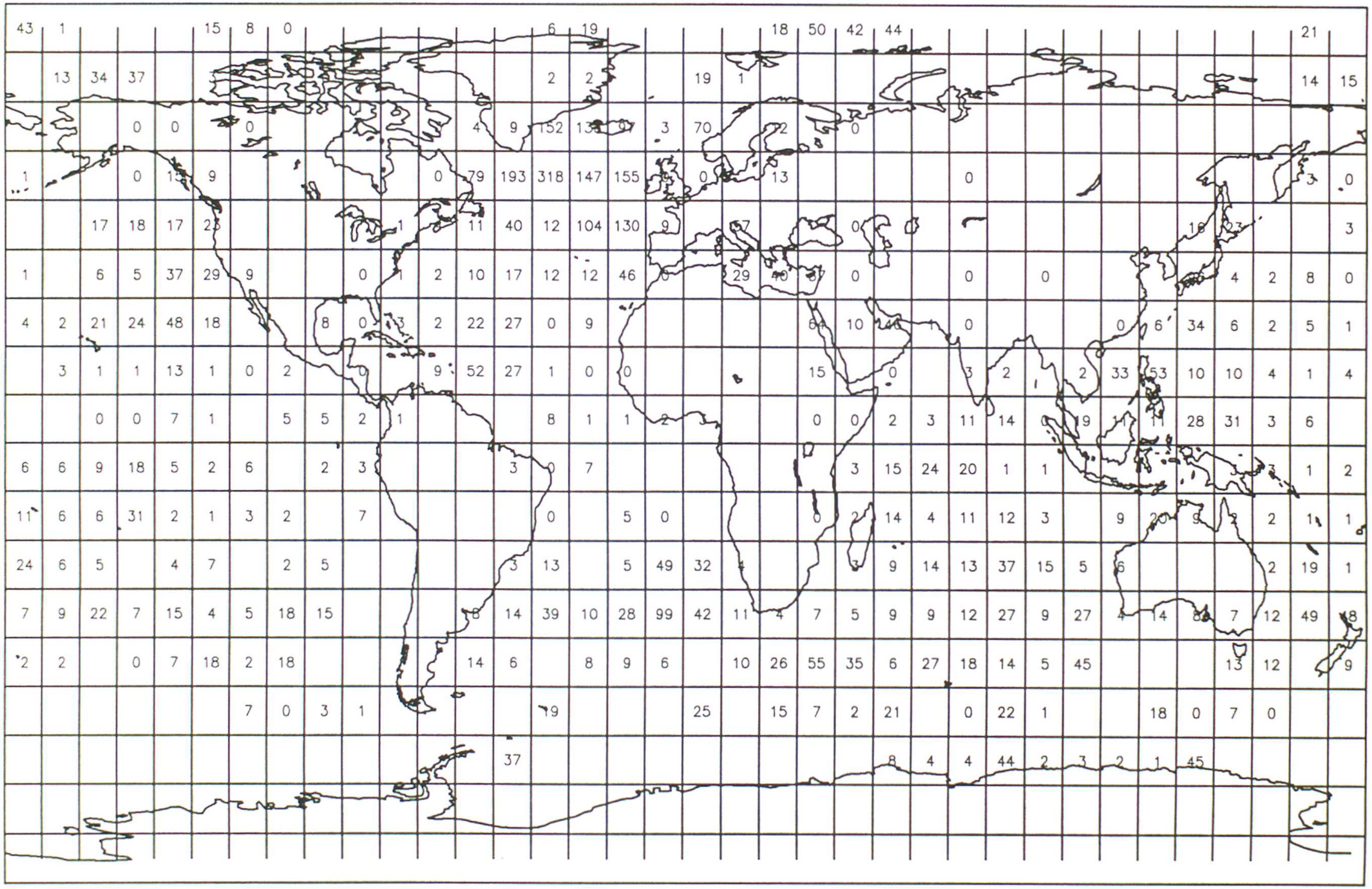

43 1 15 8 0 6 19 18 50 42 44 21
13 34 37 2 2 19 1 14 15
0 0 0 4 9 152 13 97 3 70 2 0
1 0 15 9 0 79 193 318 147 155 0 13 0 3 0
17 18 17 23 1 11 40 12 104 130 9 37 0 16 23 3
1 6 5 37 29 9 0 1 2 10 17 12 12 46 0 29 40 37 0 0 0 4 2 8 0
4 2 21 24 48 18 8 0 3 2 22 27 0 9 64 10 46 1 0 0 6 34 6 2 5 1
3 1 1 13 1 0 2 0 9 52 27 1 0 0 15 0 3 2 2 33 53 10 10 4 1 4
0 0 7 1 5 5 2 1 8 1 1 2 0 0 2 3 11 14 0 19 11 11 28 31 3 6
6 6 9 18 5 2 6 2 3 3 0 7 3 15 24 20 1 1 3 1 2
11 6 6 31 2 1 3 2 7 0 5 0 0 2 14 4 11 12 3 9 20 9 2 2 1 1
24 6 5 4 7 2 5 3 13 5 49 32 4 3 9 14 13 37 15 5 6 2 19 1
7 9 22 7 15 4 5 18 15 18 14 39 10 28 99 42 11 4 7 5 9 9 12 27 9 27 4 14 86 7 12 49 18
2 2 0 7 18 2 18 14 6 8 9 6 10 26 55 35 6 27 18 14 5 45 13 12 9
7 0 3 1 19 25 15 7 2 21 0 22 1 18 0 7 0
37 8 4 4 44 2 3 2 1 45

TABLE 3

MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: BRACKNELL
MONTH: December, 1997

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for synops & autosynops.

Standard of comparison :Background field from Bracknell global model.

Observation times :00, 06, 12, 18 UTC

Elements monitored :Mean sea level pressure (hPa).

Parameters monitored	:HT(m)	:Station height (in metres) as given in WMO No. 9 Vol A
	:RP	:Pressure reporting practice M=mean sea level pressure (hPa) reported. S=Station level pressure reported. 8=Geopotential height (m) of 850 hPa surface reported. 7=Geopotential height (m) of 700 hPa surface reported.
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	:Percentage of observations flagged.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT	:15 hPa	(pressure)
SELECTION CRITERIA	:NOBS	≥ 20 ,and one or more of the following:
	1.| bias|	≥ 4 hPa
	2. SD	≥ 6 hPa
	3.PGE	≥ 25.

N.B. For stn ht ≥ 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

WMO REGION 1:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
60437	36.3N	2.8E	981	S8	25	0	0	4	1.8	-7.8	8.0
60445	36.2N	5.4E	1081	S8	111	0	0	0	0.8	4.6	4.7
60468	35.6N	6.2E	1052	S8	105	105	100	0	0.0	0.0	0.0
60476	35.4N	7.2E	1116	S8	27	18	67	4	0.4	14.2	14.2
60511	35.3N	1.4E	1127	S8	110	109	99	0	0.0	14.6	14.6
60535	34.7N	3.3E	1144	S8	79	0	0	1	1.2	-7.2	7.3
60571	31.6N	2.2W	773	S8	97	0	0	0	1.0	-4.8	4.9
60670	24.6N	9.5E	1054	S8	105	3	3	96	1.5	9.2	9.3
63333	11.1N	39.7E	1916	MS	34	0	0	3	2.2	6.2	6.6
63402	7.7N	36.8E	1577	MS	56	1	2	0	1.2	-10.2	10.3
63451	8.7N	39.0E	1876	MS	31	0	0	0	1.2	-5.0	5.1
63453	8.8N	39.8E	1062	S	30	1	3	3	2.3	11.9	12.1
63478	5.1N	44.6E	320	MS	30	0	0	3	2.0	7.7	8.0
68396	26.5S	31.3E	641	S8	46	0	0	2	1.3	5.0	5.2
68442	29.1S	26.3E	1354	S8	115	0	0	0	1.0	-4.9	5.0
68488	28.4S	31.1E	1279	S8	47	17	36	0	1.0	-1.6	1.9

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
23383	66.9N	93.5E	278	MS	91	0	0	29	3.4	4.3	5.5
24382	66.4N	143.2E	196	MS	58	0	0	50	2.4	6.7	7.1
24671	63.9N	135.9E	402	MS	23	0	0	22	3.1	10.8	11.2
25703	62.9N	152.4E	205	MS	118	0	0	4	1.8	4.1	4.5
29813	54.0N	79.2E	144	7	27	17	63	70	7.7	3.9	8.6
30320	56.9N	105.7E	669	MS	57	57	100	0	0.0	0.0	0.0
30549	54.2N	112.0E	1302	S8	60	1	2	18	3.5	-4.3	5.5
30554	54.5N	113.6E	995	MS	61	1	2	7	1.3	9.2	9.3
30627	53.1N	105.5E	762	MS	60	1	2	13	1.6	-4.1	4.4
30664	53.5N	115.6E	811	MS	29	0	0	3	1.5	-5.1	5.3
30764	52.6N	115.2E	646	MS	58	1	2	2	1.3	-5.0	5.2
30777	52.2N	117.7E	525	MS	24	0	0	0	1.3	-4.2	4.4
30967	49.9N	115.8E	623	MS	58	1	2	2	2.1	-4.5	5.0
31123	57.8N	130.9E	255	MS	56	1	2	36	3.2	5.6	6.4
31263	54.7N	130.5E	464	M	116	0	0	29	2.7	5.5	6.1
31474	51.6N	133.3E	384	MS	112	1	1	63	3.5	6.6	7.5
31532	50.9N	132.3E	272	MS	118	0	0	53	2.7	5.5	6.1
36020	52.5N	80.2E	168	7	27	20	74	41	6.7	-1.2	6.8
40701	39.3N	44.4E	1470	MS	68	0	0	0	1.8	8.7	8.9
40710	37.9N	47.5E	-9999	M	68	1	1	57	3.3	5.3	6.2
40743	36.2N	57.7E	941	MS	114	0	0	0	1.1	-4.4	4.5
40762	35.3N	59.2E	1333	MS	114	31	27	0	0.8	-13.6	13.6
40763	35.2N	58.5E	1060	MS	33	1	3	0	1.3	-5.1	5.3
40783	32.4N	49.7E	1972	MS	69	0	0	0	1.6	-5.8	6.0
40789	33.8N	55.1E	921	MS	62	1	2	2	3.1	8.9	9.4
40798	32.3N	50.9E	1991	MS	62	0	0	2	1.6	-7.3	7.5
40836	30.8N	51.7E	1880	MS	61	2	3	0	1.5	9.4	9.5
40859	29.0N	53.7E	1383	MS	69	1	1	1	1.5	10.4	10.5
41254	23.1N	57.7E	1755	S8	87	87	100	0	0.0	0.0	0.0
41396	16.0N	48.9E	700	MS	39	0	0	0	1.4	7.4	7.5
41466	13.7N	44.1E	1385	8	44	0	0	0	1.1	-6.5	6.6
44212	50.0N	92.1E	939	MS	97	1	1	55	3.4	5.6	6.6
44416	28.6N	81.6E	720	MS	68	2	3	1	1.7	4.5	4.8
44477	27.0N	87.4E	1445	S8	68	68	100	0	0.0	0.0	0.0
47016	41.4N	128.2E	714	M	109	1	1	17	4.3	4.4	6.2
47020	41.0N	126.6E	306	M	100	0	0	3	3.2	4.2	5.3
51243	45.6N	84.9E	428	MS	120	0	0	0	1.9	4.1	4.5
51288	45.4N	90.5E	1651	S	119	0	0	43	1.8	-4.8	5.1
51334	44.6N	82.9E	321	M	119	19	16	55	3.2	9.2	9.7
51379	44.0N	89.6E	794	M	119	1	1	40	3.3	8.1	8.7

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
51495	43.5N	91.6E	874	M	119	0	0	29	3.2	6.2	7.0
51818	37.6N	78.3E	1376	M	119	0	0	66	2.7	7.9	8.3
52378	41.4N	102.4E	960	M	117	0	0	57	2.5	6.9	7.3
52602	38.8N	93.4E	2734	S	119	0	0	0	1.9	-5.1	5.4
52866	36.6N	101.8E	2262	S	120	0	0	0	1.4	-4.1	4.3
53083	44.6N	114.2E	1183	M	119	0	0	76	2.9	6.6	7.2
53352	41.7N	110.4E	1377	M	117	0	0	81	2.6	7.2	7.7
53480	41.0N	113.1E	1416	M	118	0	0	42	3.1	5.6	6.4
53487	40.1N	113.3E	1069	M	119	0	0	20	2.5	4.9	5.5
53502	39.8N	105.8E	1033	M	118	0	0	69	2.9	6.9	7.5
53588	39.0N	113.5E	2898	S	120	0	0	61	2.1	-4.1	4.6
53593	39.8N	114.6E	910	M	117	0	0	15	2.2	4.5	5.0
53705	37.5N	105.7E	1185	M	118	0	0	38	2.3	6.6	7.0
53923	35.7N	107.6E	1423	M	118	0	0	21	2.1	4.2	4.7
54308	41.2N	116.6E	661	M	118	0	0	0	2.4	4.7	5.3
54311	41.9N	117.8E	844	M	118	0	0	1	2.8	4.8	5.6
54386	41.4N	128.2E	1018	M	114	0	0	13	3.4	7.6	8.3
54587	39.1N	123.2E	-9999	M	95	1	1	0	1.1	-4.6	4.7
56144	31.8N	98.6E	3185	S	103	2	2	1	1.9	-5.2	5.5
56287	30.0N	103.0E	629	M	119	0	0	61	3.0	5.4	6.2
56385	29.5N	103.3E	3049	S	120	0	0	17	2.0	-5.5	5.9
56444	28.5N	98.9E	3488	S	117	117	100	0	0.0	0.0	0.0
56462	29.0N	101.5E	2994	S	107	1	1	1	2.3	8.0	8.3
57006	34.6N	105.8E	1143	M	118	0	0	10	2.8	6.5	7.1
58445	30.3N	119.4E	1494	S	120	0	0	45	1.7	-5.1	5.4

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
80099	7.1N	70.7W	128	MS	37	1	3	5	1.1	-5.5	5.6
83214	10.3S	54.9W	285	MS	51	1	2	4	2.0	-5.8	6.1
83235	12.4S	46.4W	660	MS	75	0	0	4	1.7	6.8	7.0
83319	14.7S	52.4W	315	MS	68	0	0	0	1.1	-4.3	4.4
83332	14.1S	46.4W	950	MS	75	21	28	0	0.7	13.7	13.7
83408	14.3S	43.8W	556	MS	68	1	1	0	1.0	10.6	10.6
83423	16.7S	49.3W	729	MS	76	0	0	0	1.1	-5.4	5.5
83488	17.8S	42.9W	1097	MS	77	77	100	0	0.0	0.0	0.0
83531	18.6S	46.5W	896	MS	76	1	1	1	1.0	-6.6	6.7
83587	19.9S	43.9W	850	MS	78	0	0	0	0.8	-6.9	6.9
83704	22.3S	53.9W	369	MS	52	0	0	63	5.1	-4.8	7.0
83773	23.1S	48.9W	793	S	33	1	3	0	1.3	-5.2	5.4
84401	5.2S	80.6W	55	MS	88	0	0	0	1.2	5.3	5.4
84425	5.9S	76.1W	184	MS	64	0	0	3	2.2	4.4	4.9
84455	6.5S	76.4W	282	MS	67	0	0	1	1.3	7.2	7.3
84472	7.1S	78.5W	2622	S	45	0	0	0	1.1	-5.5	5.6
84501	8.1S	79.0W	30	MS	94	0	0	0	1.4	5.1	5.3
84542	9.4S	77.6W	2760	S	38	2	5	5	3.3	4.4	5.5
84686	13.6S	72.0W	3249	S	94	0	0	1	1.9	-5.5	5.8
84782	18.1S	70.3W	469	MS	90	0	0	0	1.5	8.8	8.9
85141	14.5S	67.6W	202	MS	43	0	0	53	2.4	5.6	6.1
85312	19.8S	63.9W	992	S	31	1	3	0	2.2	-10.9	11.1
85406	18.3S	70.3W	58	M	116	0	0	0	1.3	6.9	7.0
85418	20.5S	70.2W	48	M	112	0	0	1	1.4	4.4	4.6
85442	23.4S	70.4W	135	M	118	0	0	1	1.2	5.3	5.4
85460	26.3S	70.6W	30	M	32	0	0	0	1.1	4.2	4.3
85488	29.9S	71.2W	142	MS	114	0	0	1	1.4	4.0	4.2

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
71094	66.7N	61.4W	722	MS	26	0	0	27	2.0	-5.9	6.2
71882	51.0N	118.2W	443	MS	120	0	0	45	3.8	5.9	7.0
71889	49.5N	119.6W	344	MS	119	0	0	3	3.5	4.2	5.5
71917	80.0N	85.9W	10	MS	120	0	0	2	2.5	4.7	5.3
72476	39.1N	108.5W	1475	MS	118	0	0	1	1.8	4.5	4.8
76625	20.6N	100.4W	1813	MS	31	0	0	0	0.9	-8.0	8.1
76632	20.1N	98.7W	2417	MS	38	0	0	89	1.2	-5.6	5.7
76634	20.1N	98.4W	2135	MS	55	0	0	82	1.3	-5.3	5.5
76658	19.2N	103.7W	494	MS	24	0	0	0	1.3	6.5	6.6
76762	17.5N	99.5W	1865	MS	43	43	100	0	0.0	0.0	0.0
76775	17.1N	96.7W	1550	MS	32	1	3	0	0.9	4.1	4.2
76845	16.7N	92.6W	2276	MS	61	61	100	30	0.0	0.0	0.0
78627	15.3N	91.5W	1901	S	32	3	9	0	1.7	4.5	4.8
78718	14.4N	87.6W	626	MS	24	23	96	0	0.0	-7.3	7.3

WMO REGION 5:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
94328	22.4S	133.6E	623	MS	130	0	0	39	1.3	7.1	7.2
94955	41.6S	145.7E	684	MS	191	191	100	0	0.0	0.0	0.0

WMO REGION 6:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
02045	67.8N	20.4E	408	M	93	93	100	0	0.0	0.0	0.0
04416	72.6N	38.4W	3207	S	101	70	69	8	3.9	3.8	5.4
11180	47.7N	15.8E	1546	S8	100	0	0	40	1.9	-4.4	4.8
16227	41.9N	13.6E	655	MS	110	94	85	0	1.4	-13.1	13.2
16549	39.1N	8.3E	12	MS	93	0	0	0	1.1	-4.3	4.4
16614	40.4N	21.3E	604	MS	73	0	0	5	1.2	-7.0	7.1

ANTARCTIC:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89264	71.4S	68.9W	780	S	59	0	0	25	2.3	6.0	6.4
89345	89.7S	148.8W	620	S	90	39	43	0	4.7	-6.9	8.3
89606	78.5S	106.9E	3490	S7	117	5	4	0	5.2	-5.1	7.3
89744	74.0S	43.0E	3353	S	85	0	0	0	1.5	4.7	4.9
89860	74.2S	160.3E	1772	S	79	0	0	28	2.1	-8.2	8.5

TABLE 4

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: December, 1997

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from Bracknell global model.

Observation times :All hours combined.

Level(s) monitored :70.0 - 500.0 hPa

Elements monitored :TEMP in °C ; WIND in $m\ s^{-1}$

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 $m\ s^{-1}$ Vector Wind

SELECTION CRITERIA :N REP $\geq$ 20

NB: US ACARs and ADS data are shown at the bottom of the table as US ACAR and ADS respectively.

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAA	123	3	15	2.8	1.1	120	0	100	0	15.1	-0.7
AAL	5298	0	1	1.8	0.3	5278	0	2	0	9.0	1.0
AAR	1970	0	2	2.0	-0.2	1933	0	3	0	8.9	0.6
ACA	1738	1	1	1.7	0.1	1755	0	2	0	7.7	0.7
ACI	71	0	1	1.8	0.7	69	0	3	1	9.0	1.5
AEA	656	1	100	3.4	1.6	642	0	10	0	11.2	0.9
AEL	641	0	26	1.7	-0.4	636	0	5	0	10.4	0.8
AEY	138	1	1	1.6	0.8	136	0	1	0	8.9	1.6
AFL	485	1	4	1.9	0.3	485	0	5	0	8.9	0.5
AFR	1929	1	10	1.8	0.2	1842	0	10	0	9.4	0.8
AIH	241	0	4	1.6	0.3	190	1	8	0	8.7	1.8
AJM	85	1	2	1.5	-0.1	78	1	3	0	9.1	1.6
AMT	403	1	100	2.6	1.7	380	0	4	0	9.4	0.7
AMX	335	1	4	2.0	0.1	335	1	4	0	9.5	1.4
ANA	1121	2	4	2.0	-0.1	1120	0	5	0	10.3	0.4
ANZ	2387	3	5	1.8	0.1	2315	0	4	1	8.6	1.1
AOM	791	3	6	1.9	0.7	713	0	7	0	11.5	0.4
ARP	113	1	3	1.9	0.4	113	0	4	0	10.1	1.0
AUA	26	4	8	2.1	-1.2	27	0	0	0	8.9	-0.1
AVA	433	1	4	1.9	0.3	435	1	7	0	11.4	1.5
AVN	49	4	4	0.9	0.1	48	0	0	0	7.4	-0.2
AXA	50	0	2	2.1	1.1	49	0	4	0	10.0	-0.1
AZA	359	1	4	1.6	0.4	321	0	5	0	10.2	0.3
BAL	745	1	9	1.8	-0.1	715	0	10	0	8.8	1.0
BAW	1571	1	8	1.8	0.2	1527	0	7	0	8.3	1.1
BBB	46	0	0	1.7	-0.2	42	0	2	0	9.0	0.0
BWA	359	2	100	3.6	2.6	348	2	6	0	11.1	0.6
CAL	1657	0	1	2.0	0.0	1666	1	3	0	9.8	1.0
CCA	151	1	8	2.8	-0.3	132	0	99	0	14.0	0.7
CDN	1944	1	1	2.0	0.5	1941	0	2	0	8.4	0.8
CES	295	1	2	2.1	0.4	283	2	4	0	9.8	0.8
CFG	1314	0	2	1.8	-0.7	1303	0	3	0	9.6	0.5
CKS	287	1	5	3.0	2.1	274	0	4	0	8.7	1.4
CKT	216	0	6	1.9	0.5	215	0	9	0	11.3	0.2
CLX	348	1	1	1.7	-0.3	353	0	3	0	8.0	0.6
CMI	623	1	2	1.7	0.8	623	0	2	0	8.1	0.1
CMM	414	1	2	1.9	0.1	387	0	4	0	10.3	0.4
COA	1486	1	3	1.8	0.5	1492	0	6	0	11.1	2.4
CPA	65	0	3	2.1	0.2	68	0	1	0	9.3	0.2
CRL	633	1	3	1.7	0.7	598	0	3	0	9.3	1.3
CSA	21	0	5	1.8	-0.4	22	0	14	5	15.6	-4.0
CSN	89	1	3	2.4	0.5	89	1	1	0	8.0	0.5
CTB	217	1	2	1.4	0.2	217	0	4	0	9.3	1.1
CTM	59	7	15	2.7	-0.9	56	0	13	0	11.9	0.6
CUB	525	1	7	2.8	1.6	523	1	77	0	11.8	1.1
DAF	29	3	3	2.9	-0.2	29	0	0	0	7.2	1.3
DAL	4748	0	2	2.1	0.5	4764	0	3	0	9.0	0.8
DBY	182	1	2	1.6	-0.2	185	1	3	0	8.7	0.6
DHL	180	1	100	3.5	-2.1	178	0	100	1	10.2	1.3
DLH	3285	0	7	1.8	0.4	3263	0	10	2	8.4	0.6
DOA	35	3	6	1.6	-0.7	33	0	6	0	12.6	1.0
EIA	256	0	1	1.5	0.4	254	0	9	0	11.5	1.7
EIN	20	0	20	2.3	1.0	20	0	60	0	24.3	15.6
ELY	113	2	6	2.0	0.1	114	1	10	0	9.2	-0.8
EVA	1517	1	1	1.9	-0.3	1542	0	2	0	8.8	0.3
EWW	119	4	100	2.6	0.6	119	0	100	0	12.7	1.4
FDX	1015	0	2	1.9	0.7	1021	0	2	0	8.7	1.1
FFF	21	0	10	1.5	0.4	21	76	100	0	40.6	1.0
FIN	377	1	4	1.6	0.5	375	0	5	0	9.7	1.3

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
FJI	532	7	9	1.6	0.6	501	0	3	0	8.0	0.1
FOM	138	4	5	1.3	0.7	132	0	2	0	8.2	0.8
GAF	38	0	0	1.9	-1.0	39	0	3	0	9.2	1.2
GCO	72	0	4	2.0	1.2	73	0	4	0	8.6	1.0
GHA	74	1	3	1.5	0.6	46	0	7	0	11.9	2.7
GIA	300	1	3	1.8	0.9	245	0	2	0	8.8	0.8
GTI	83	2	2	2.2	0.9	81	0	5	0	8.7	0.8
HAL	1798	0	1	1.8	0.5	1780	0	3	0	10.6	0.7
HLF	200	0	1	1.9	-0.5	199	1	3	0	9.7	-0.7
HRH	85	20	22	1.5	0.5	65	0	2	0	5.4	0.4
IBE	2104	1	9	2.0	0.6	2098	0	10	0	10.3	0.7
ICE	721	0	1	1.5	0.1	718	0	1	0	7.6	0.8
IRL	29	0	3	2.8	2.1	29	0	0	0	6.2	-0.1
JAA	29	0	3	2.7	1.0	29	0	0	0	9.7	3.4
JAL	6555	0	1	1.9	0.4	6585	0	2	0	8.8	0.7
JAZ	41	0	0	2.1	1.7	40	0	3	3	6.4	0.9
KAL	3342	1	3	2.0	-0.1	3308	0	3	0	9.5	0.9
KLM	3508	0	2	1.7	0.3	3492	0	3	0	8.6	0.7
LDA	324	1	15	1.8	-0.7	328	1	17	0	9.7	1.5
LDI	469	0	30	1.6	0.1	475	0	14	0	10.5	1.3
LEI	253	0	1	1.9	0.8	251	0	3	0	9.0	0.7
LIB	437	1	2	1.7	0.8	433	0	5	0	10.6	0.9
LKR	37	0	3	1.3	0.6	37	0	3	0	9.7	1.3
LOT	180	0	2	1.9	-1.1	181	0	2	0	6.6	0.5
LTU	849	1	4	1.7	0.3	831	0	5	0	9.3	0.7
MAS	319	0	1	2.0	-0.6	251	0	74	0	10.5	0.6
MDA	161	0	1	1.8	0.9	161	2	4	0	8.3	-0.3
MON	44	2	14	1.4	0.1	41	0	15	0	9.5	0.8
MPD	175	2	5	2.3	1.0	171	1	4	0	10.4	1.1
MPH	1283	0	2	1.7	-0.6	1292	0	3	0	9.0	0.5
NCA	691	0	1	1.7	0.3	691	0	3	0	8.4	0.8
NWA	9310	0	1	1.9	0.7	9371	0	2	0	8.7	0.9
OAL	21	0	0	2.7	1.9	21	0	5	0	9.6	1.6
PAC	141	1	9	2.0	0.7	126	0	11	0	11.0	1.1
PAL	1078	1	2	1.8	-0.2	1038	0	3	0	9.7	0.7
PAO	306	1	6	1.6	0.1	303	0	3	0	6.0	0.6
QFA	1491	2	6	1.5	0.3	1471	0	6	1	9.4	0.6
RAF	106	2	4	1.5	0.4	103	0	22	1	9.0	0.8
RAM	72	0	6	2.7	-0.8	71	3	6	0	12.1	3.0
RCH	339	4	96	2.5	0.9	326	0	95	0	11.0	1.7
RJA	56	4	5	1.8	1.0	56	0	2	0	8.3	0.4
RKA	111	3	5	1.8	0.3	58	2	7	0	11.7	1.9
RON	24	0	4	1.8	-0.3	24	0	4	4	6.1	0.9
ROY	41	0	2	1.3	0.5	39	0	5	0	7.9	0.9
RRR	37	3	27	2.2	0.3	37	0	27	0	13.2	-0.8
SAA	274	0	2	1.7	-0.5	249	0	2	0	9.5	0.4
SAB	24	0	0	1.2	-0.5	24	0	0	0	6.8	1.5
SAS	1100	0	1	1.8	0.2	1103	0	2	0	8.2	0.7
SCX	211	2	3	1.9	1.1	164	0	3	0	7.7	0.0
SIA	1168	1	2	1.9	-0.6	1138	0	4	0	9.3	0.5
SLR	114	2	16	1.6	-0.2	113	0	16	0	12.8	1.4
SOL	37	0	0	1.1	0.6	37	0	0	0	4.7	0.6
SPP	225	1	3	1.6	-0.1	221	0	6	0	11.4	2.5
SVA	144	0	3	1.8	0.5	150	0	100	0	14.1	3.3
SVV	24	0	4	3.1	1.8	22	0	0	0	10.5	-1.1
SWR	171	1	4	1.8	0.2	172	0	4	0	7.9	0.8
TAP	578	1	4	2.0	-0.1	563	1	6	0	10.5	1.2
THA	358	1	3	2.0	-0.4	353	1	5	0	10.2	0.3
TOW	113	1	4	1.5	-0.3	113	0	4	0	7.0	0.5

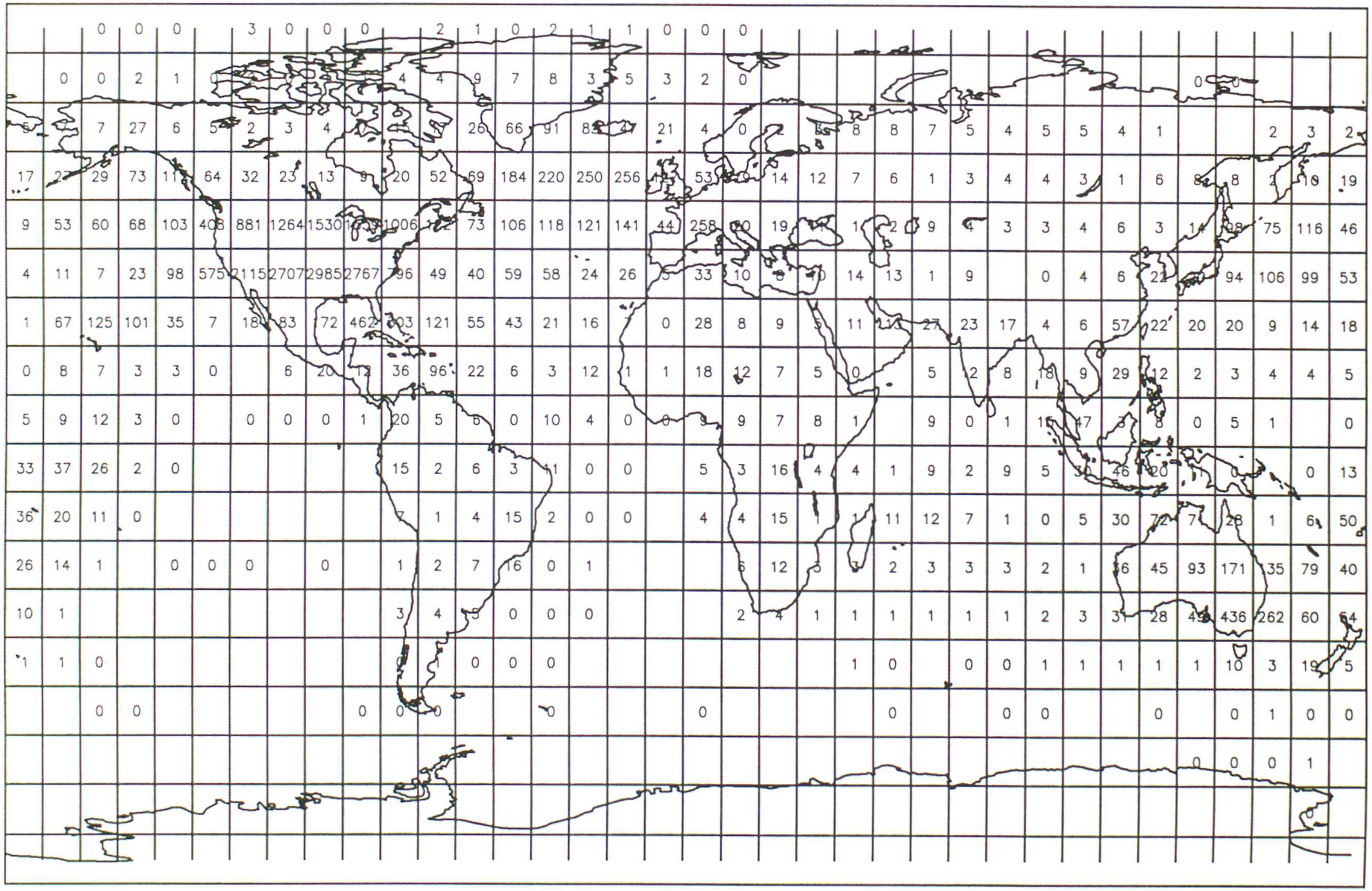
	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
TSC	22	0	0	1.7	0.1	21	0	5	0	10.6	5.2
TWA	1617	1	3	2.0	0.2	1634	0	3	0	9.2	1.3
UAL	11377	0	3	2.0	0.0	11355	0	2	0	8.6	1.0
UNS	1041	0	27	1.3	0.4	1039	0	27	0	7.0	1.1
UPS	741	1	10	2.0	0.3	751	0	9	0	9.3	0.7
USA	324	0	1	1.8	0.2	329	0	2	0	9.1	0.9
VIR	302	1	2	1.8	-0.3	303	0	2	0	7.5	0.7
VKG	71	1	3	2.0	1.1	68	0	7	0	12.6	0.5
VRG	32	0	0	1.6	0.8	29	0	0	0	8.6	1.5
VSP	199	2	4	2.2	0.5	199	1	3	0	9.5	1.5
WOA	89	0	4	1.9	1.1	91	0	7	0	8.8	1.9
AF	22	0	0	1.8	-0.8	20	5	5	0	8.6	1.8
AN	27212	1	2	1.5	0.1	27197	0	0	0	6.2	0.8
AR	1188	2	94	1.7	1.1	1188	0	94	0	8.2	1.2
BA	22151	0	0	1.2	0.4	22091	0	0	0	7.0	1.4
FJ	22	0	5	0.7	0.4	21	0	5	0	5.2	1.3
IT	398	0	2	1.2	0.2	398	0	2	0	7.4	1.1
KL	12278	0	1	1.3	0.5	12279	0	0	0	7.0	0.8
LH	3722	0	1	1.4	0.3	3711	0	1	0	7.3	1.7
MK	4081	0	0	1.0	0.6	4055	0	19	0	7.0	1.3
QF	24193	0	0	1.0	0.2	24193	0	0	0	6.1	1.0
SA	2127	0	0	1.4	1.0	2127	0	0	0	6.8	1.3
SV	1458	0	27	1.2	0.7	1450	0	27	0	6.0	0.5
N	540	1	4	2.6	0.5	453	0	3	0	8.7	0.8
ADS	917	0	0	1.1	-0.1	917	0	21	0	5.8	0.9
US ACAR	529054	0	2	1.5	0.2	528166	0	2	0	6.9	1.0

MEAN DAILY COUNT OF AIRCRAFT 70 – 500 HPA

DECEMBER 1997

OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

FIGURE 3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0 0 2 1 4 4 9 7 8 3 5 3 2 0 0 0
5 7 7 27 6 5 2 3 4 26 66 91 83 47 21 4 0 8 8 7 5 4 5 5 4 1 2 3 2
17 27 29 73 11 64 32 23 13 9 20 52 69 184 220 250 256 53 14 12 7 6 1 3 4 4 3 1 6 8 8 2 10 19
9 53 60 68 103 408 881 1264 1530 1006 73 106 118 121 141 44 258 19 1 2 9 4 3 3 4 6 3 14 75 116 46
4 11 7 23 98 575 2115 2707 2985 2767 796 49 40 59 58 24 26 33 10 14 13 1 9 0 4 6 22 94 106 99 53
1 67 125 101 35 7 18 83 72 462 303 121 55 43 21 16 0 28 8 9 11 23 17 4 6 57 22 20 20 9 14 18
0 8 7 3 3 0 6 20 12 36 96 22 6 3 12 1 1 18 12 7 5 0 5 12 8 18 9 29 12 2 3 4 4 5
5 9 12 3 0 0 0 0 1 20 5 6 0 10 4 0 0 9 9 7 8 1 9 0 1 15 47 8 0 5 1 0
33 37 26 2 0 15 2 6 3 11 0 0 5 3 16 4 4 1 9 2 9 5 30 46 20 0 13
36 20 11 0 7 1 4 15 2 0 0 4 4 15 1 1 11 12 7 1 0 5 30 72 7 28 1 6 50
26 14 1 0 0 0 0 1 2 7 16 0 1 6 12 3 3 2 3 3 3 2 1 36 45 93 171 35 79 40
10 1 3 4 5 0 0 0 2 4 1 1 1 1 1 1 2 3 31 28 49 436 262 60 54
1 1 0 0 1 0 0 0 1 0 0 0 1 1 1 1 1 10 3 19 5
0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0
0 0 0 1

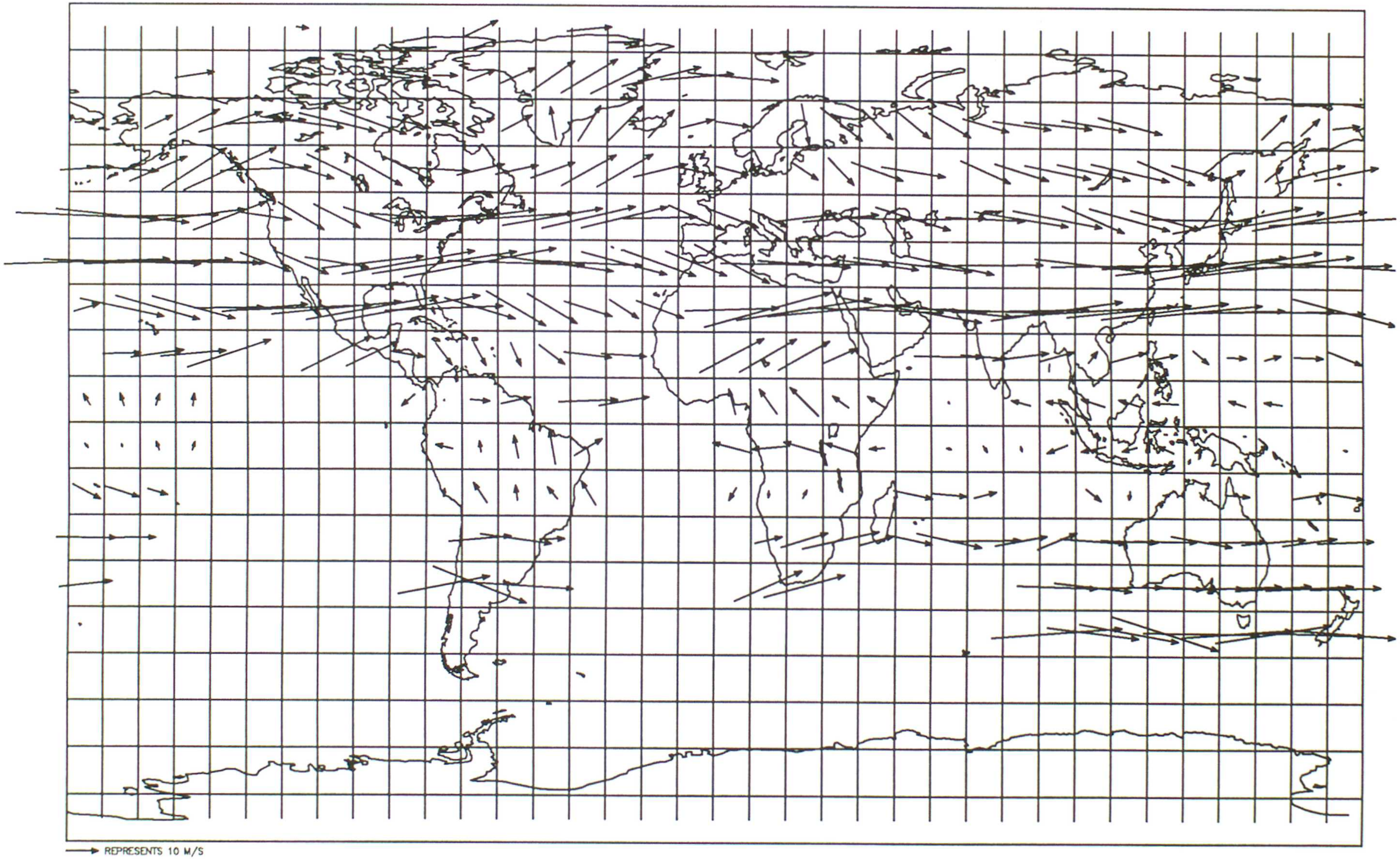
AIRCRAFT MEAN WINDS BETWEEN 70 AND 500 HPA

DECEMBER 1997

OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT

FIGURE 4



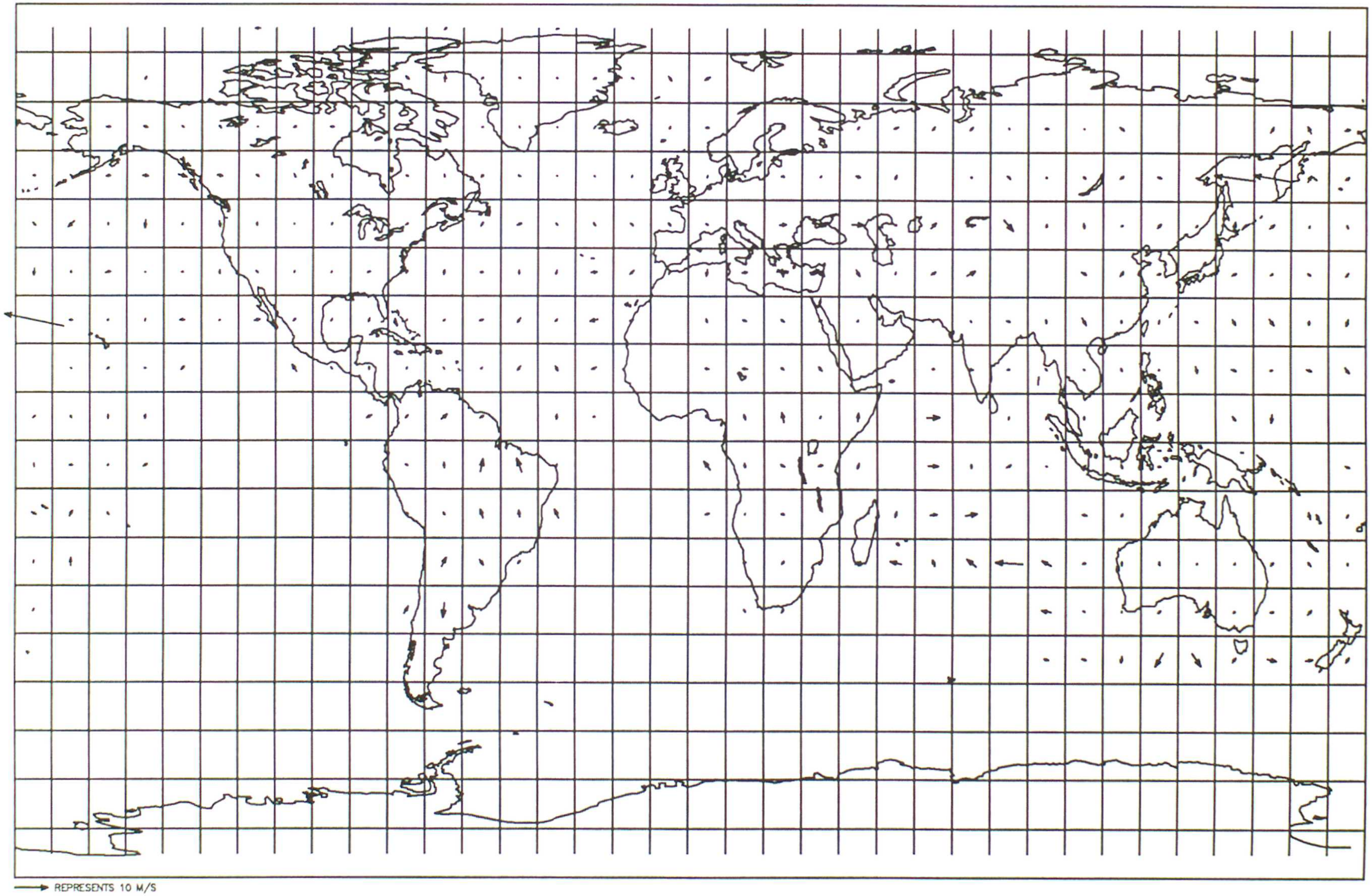
AIRCRAFT MEAN O–B WINDS BETWEEN 70 A 500 HPA

FIGURE 5

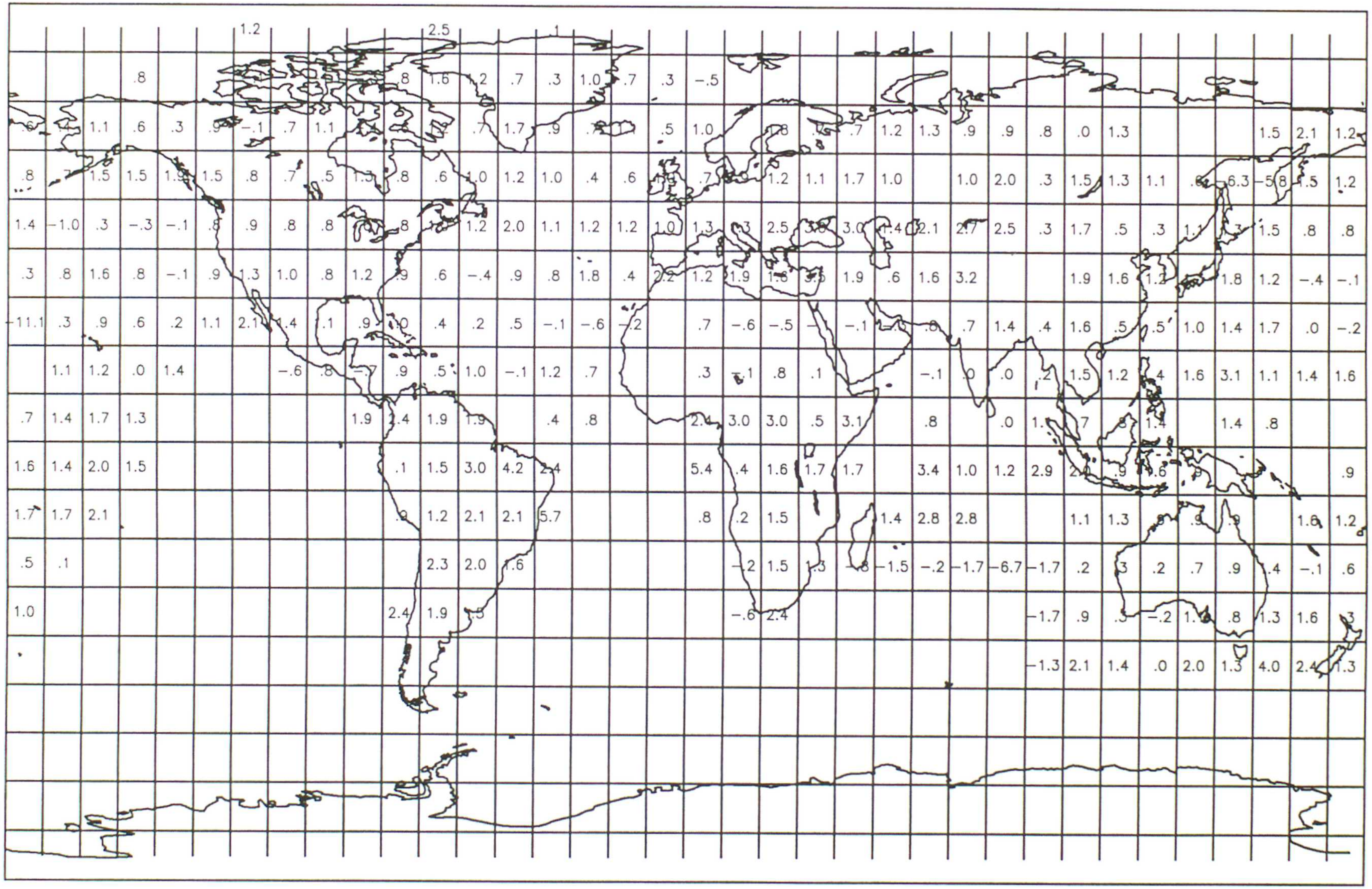
DECEMBER 1997

OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT



AIRCRAFT : MEAN O–B SPEEDS (M/S) BETWEEN 70 AND 500 HPA FIGURE 6
DECEMBER 1997
OBSERVATIONS WITH O–B VECTOR DIFFERENCE > 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT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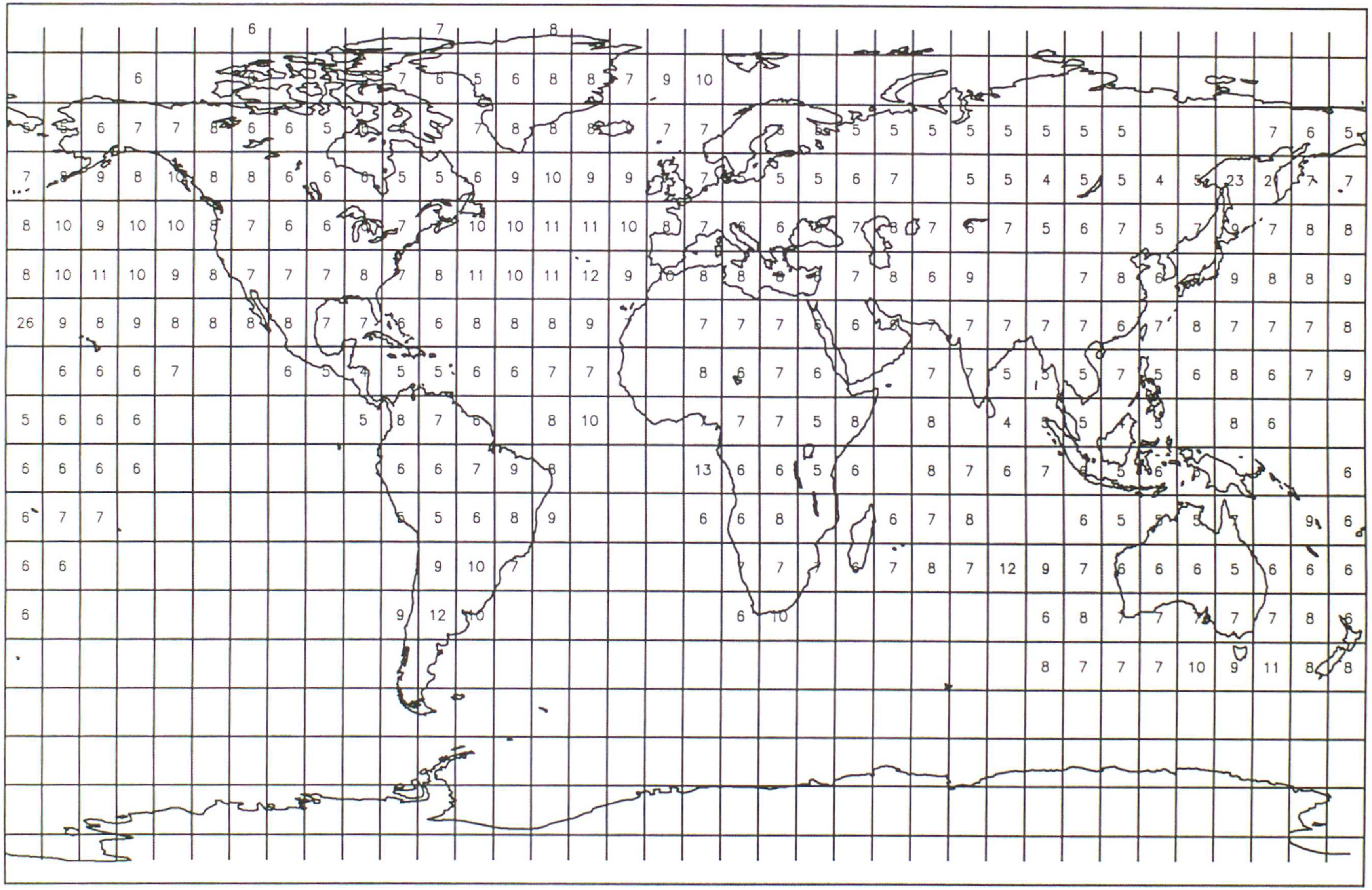
.8 .8 1.6 .2 .7 .3 1.0 .7 .3 –.5
.6 1.1 .6 .3 .9 –.1 .7 1.1 .7 1.7 .9 .7 .5 1.0 .8 .7 1.2 1.3 .9 .9 .8 .0 1.3 1.5 2.1 1.2
.8 .7 1.5 1.5 1.5 1.5 .8 .7 .5 1.3 .8 .6 1.0 1.2 1.0 .4 .6 .7 1.2 1.1 1.7 1.0 1.0 2.0 .3 1.5 1.3 1.1 –6.3 –5.8 1.5 1.2
1.4 –1.0 .3 –.3 –.1 .8 .9 .8 .8 .8 1.2 2.0 1.1 1.2 1.2 1.0 1.3 .3 2.5 3.0 3.0 1.4 2.1 2.7 2.5 .3 1.7 .5 .3 1.1 1.5 .8 .8
.3 .8 1.6 .8 –.1 .9 1.3 1.0 .8 1.2 .9 .6 –.4 .9 .8 1.8 .4 2.2 1.2 1.9 1.6 3.5 1.9 .6 1.6 3.2 1.9 1.6 1.2 1.8 1.2 –.4 –.1
–11.1 .3 .9 .6 .2 1.1 2.1 1.4 .1 .9 1.0 .4 .2 .5 –.1 –.6 –.2 .7 –.6 –.5 –.1 .8 .7 1.4 .4 1.6 .5 .5 1.0 1.4 1.7 .0 –.2
1.1 1.2 .0 1.4 –.6 .8 –.7 .9 .5 1.0 –.1 1.2 .7 .3 –.1 .8 .1 –.1 .0 .0 .2 1.5 1.2 .4 1.6 3.1 1.1 1.4 1.6
.7 1.4 1.7 1.3 1.9 2.4 1.9 1.9 .4 .8 2.4 3.0 3.0 .5 3.1 .8 .0 1.1 .7 .8 1.4 1.4 .8
1.6 1.4 2.0 1.5 .1 1.5 3.0 4.2 2.4 5.4 .4 1.6 1.7 1.7 3.4 1.0 1.2 2.9 2.4 .9 .6 .9 .9
1.7 1.7 2.1 .9 1.2 2.1 2.1 5.7 .8 .2 1.5 1.4 2.8 2.8 1.1 1.3 .8 .9 .9 1.6 1.2
.5 .1 2.3 2.0 1.6 –.2 1.5 1.3 –.8 –1.5 –.2 –1.7 –6.7 –1.7 .2 .3 .2 .7 .9 .4 –.1 .6
1.0 2.4 1.9 1.5 –.6 2.4 –1.7 .9 .3 –.2 1.6 .8 1.3 1.6 .3
–1.3 2.1 1.4 .0 2.0 1.3 4.0 2.4 1.3

AIRCRAFT : RMS O–B VECTOR (M/S) BETWEEN 70 AND 500 HPA FIGURE 7
DECEMBER 1997
OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT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6 6 7 6 5 6 8 8 7 9 10
5 5 6 7 7 8 6 6 5 6 6 5 7 8 8 8 7 7 5 5 5 5 5 5 5 5 5 5 7 6 5
7 8 9 8 10 8 8 6 6 6 5 5 6 9 10 9 9 7 7 5 5 5 6 7 5 5 4 5 5 4 5 23 2 7 7
8 10 9 10 10 8 7 6 6 6 7 10 10 11 11 10 8 7 6 6 6 7 8 7 6 7 5 6 7 5 7 9 7 8 8
8 10 11 10 9 8 7 7 7 8 7 8 11 10 11 12 9 10 8 8 8 6 7 8 6 9 7 8 6 9 8 8 9
26 9 8 9 8 8 8 8 7 7 6 6 8 8 8 9 7 7 7 7 5 6 8 7 7 7 7 7 6 7 8 7 7 7 8
6 6 6 7 6 5 4 5 5 6 6 7 7 8 6 7 6 7 7 5 5 5 7 5 6 8 6 7 9
5 6 6 6 5 8 7 6 8 10 7 7 7 5 8 8 4 5 5 4 5 8 6
6 6 6 6 6 6 7 9 8 13 6 6 5 6 8 7 6 7 6 5 6 6 6
6 7 7 6 5 6 8 9 6 6 8 6 7 8 6 5 5 5 7 9 6
6 6 9 10 7 7 7 7 6 7 8 7 12 9 7 6 6 6 5 6 6 6
6 9 12 10 6 10 6 8 7 7 7 7 7 8 6
8 7 7 7 10 9 11 8 8

TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: December, 1997

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from Bracknell global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 1000.0 - 30.0 hPa

Element monitored :GEOPOTENTIAL HEIGHT IN metres

Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown duringperiod.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.

GROSS ERROR LIMITS :Defined in Appendix I.1

SELECTION CRITERIA : ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS.

ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
20674	00	Z	300	73/ 80	21	0	50.4	-63.9	81.3	4
28722	00	Z	50	55/ 56	24	0	42.9	-186.7	191.5	5
42101	12	Z	150	30/ 76	17	0	103.9	-12.7	104.7	5
42314	00	Z	250	27/ 95	20	0	77.7	-50.3	92.6	5
42314	12	Z	50	27/ 95	11	0	71.5	-140.7	157.8	7
42339	12	Z	70	26/ 73	11	1	94.7	144.6	172.9	6
42369	00	Z	50	27/ 81	15	1	130.8	-153.9	201.9	7
42369	12	Z	50	27/ 81	15	1	138.3	-82.5	161.0	6
42397	12	Z	200	27/ 88	23	0	95.0	-10.3	95.6	7
42647	12	Z	70	23/ 73	11	2	121.6	115.9	168.0	7
42701	00	Z	70	23/ 85	12	0	155.9	54.1	165.0	6
42724	12	Z	250	24/ 91	21	0	79.7	35.0	87.1	6
42971	00	Z	70	20/ 86	21	0	106.0	111.1	153.6	5
42971	12	Z	150	20/ 86	24	0	88.3	26.7	92.2	5
43003	12	Z	200	19/ 73	23	0	75.2	101.0	125.9	8
43014	00	Z	100	20/ 75	5	7	193.7	-185.4	268.2	4
43014	12	Z	100	20/ 75	9	5	97.5	-113.1	149.3	5
43128	12	Z	70	17/ 78	20	0	138.0	88.9	164.1	6
43185	12	Z	70	16/ 81	16	1	72.8	184.0	197.9	6
43279	12	Z	70	13/ 80	11	0	78.5	103.7	130.1	4
43285	12	Z	100	13/ 75	23	0	96.0	118.7	152.6	7
43295	12	Z	200	13/ 78	18	0	85.6	102.1	133.2	7
43353	00	Z	100	10/ 76	16	0	62.7	-101.0	118.9	4
43369	00	Z	70	8/ 73	10	0	125.1	-76.1	146.4	5
43369	12	Z	70	8/ 73	10	0	96.5	127.9	160.2	5
43371	12	Z	200	8/ 77	25	0	92.4	47.0	103.6	8
54497	00	Z	200	40/ 124	29	0	45.2	69.4	82.9	8
54497	12	Z	200	40/ 124	28	0	31.4	81.1	87.0	8
60360	12	Z	500	37/ 8	5	11	19.3	-132.4	133.8	8
60490	12	Z	500	36/ -1	4	16	43.4	-88.5	98.6	9
62306	12	Z	150	31/ 27	23	0	80.5	85.3	117.3	5
62414	12	Z	50	24/ 33	17	2	108.4	118.6	160.7	4
82824	12	Z	30	-9/ -64	13	0	96.8	227.4	247.1	4
89022	12	Z	250	-75/ -27	21	4	62.3	70.1	93.8	9
89664	00	Z	30	-78/ 167	7	3	68.1	294.0	301.8	9
97560	12	Z	200	-1/ 136	21	0	45.6	-83.8	95.4	8

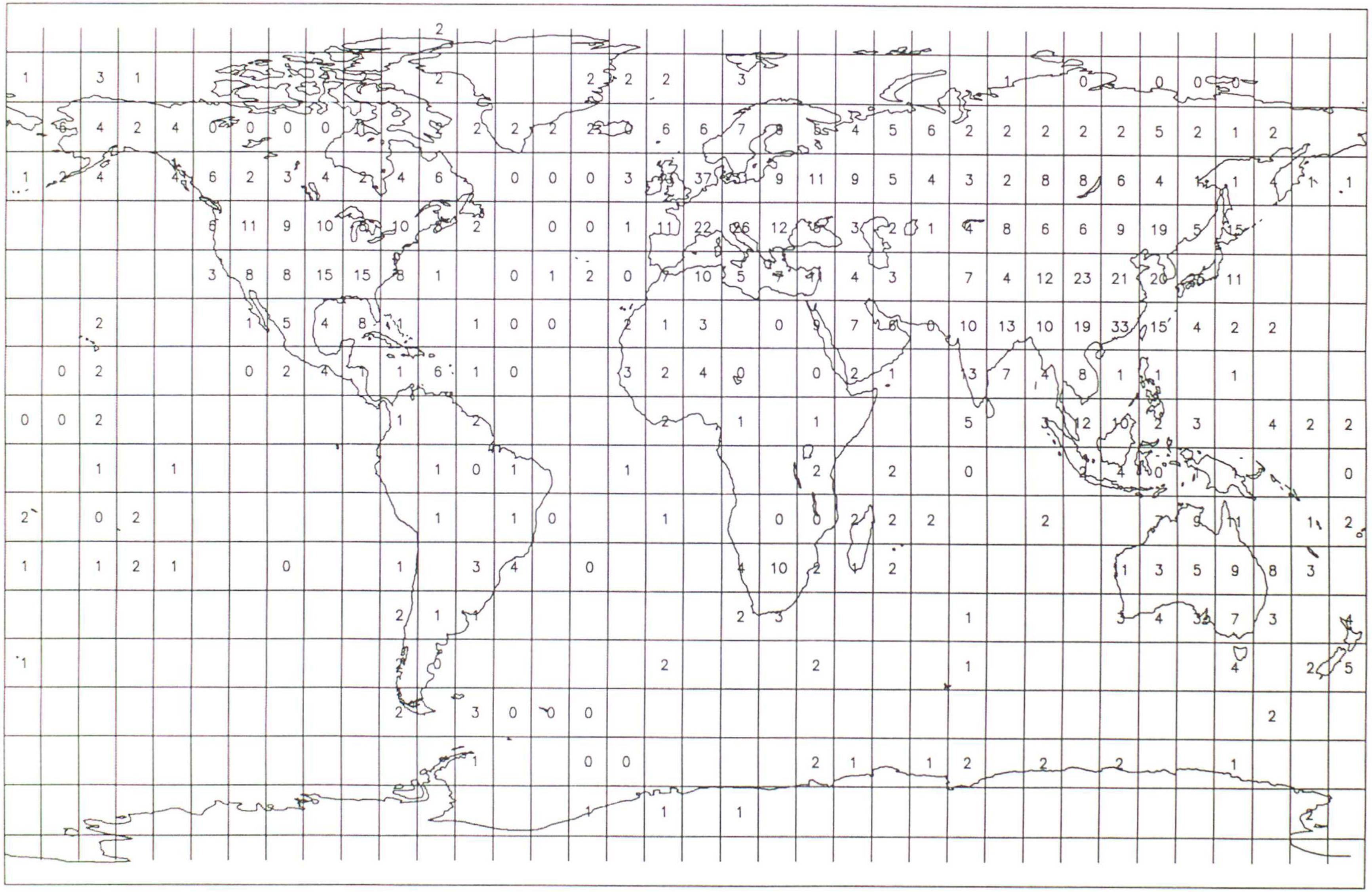
AVAILABILITY – TEMP – 500 HPA GEOPOTENTIAL – DECEMBER 1997

FIGURE 8

ALL HOURS

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS – 1281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6 11 9 10 10 10 2 0 0 1 11 22 26 12 6 3 2 1 4 8 6 6 9 19 5 15
3 8 8 15 15 8 1 0 1 2 0 7 10 5 7 41 4 3 7 4 12 23 21 20 6 11
2 1 5 4 8 1 1 0 0 2 1 3 0 9 7 8 0 10 13 10 19 33 15 4 2 2
0 2 0 2 4 1 1 6 1 0 3 2 4 0 0 2 1 13 7 4 8 1 1 1
0 0 2 1 2 2 1 1 5 3 12 10 2 3 4 2 2
1 1 1 0 1 1 2 2 0 4 0 0
2 0 2 1 1 0 1 0 0 2 2 2 2 9 11 1 2
1 1 2 1 0 1 3 4 0 4 10 2 1 2 1 3 5 9 8 3
2 1 1 2 3 1 3 4 3 7 3 4
1 2 2 1 4 2 5
2 3 0 0 0 2
1 0 0 2 1 1 2 2 2 1
1 1 1 2

TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: December, 1997

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from Bracknell global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 1000.0 - 100.0 hPa

Element monitored :VECTOR WIND in m s^{-1}

Parameters monitored

:NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:% REJ :Percentage of observations rejected by quality control at level shown during period.

:UBIAS,VBIAS :Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

:NUM LEVELS :Number of levels satisfying selection criteria.

GROSS ERROR LIMITS :Defined in Appendix I.2

SELECTION CRITERIA : ≥ 10 observations and ≥ 15 m s^{-1} RMS vector wind.

ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	% REJ	UBIAS	VBIAS	RMS	LEVELS
42339	00	V	150	26/ 73	22	0	4	-1.7	-10.3	16.3	1
42339	12	V	150	26/ 73	22	0	13	5.2	-10.3	19.1	1
42369	00	V	250	27/ 81	23	0	4	-5.8	-6.2	15.2	1
42369	12	V	200	27/ 81	20	2	13	-15.0	-9.1	15.5	1
42397	00	V	100	27/ 88	24	0	8	-4.5	-6.5	16.8	2
42397	12	V	200	27/ 88	23	0	17	-13.1	-11.4	17.0	4
43014	00	V	250	20/ 75	14	0	0	12.8	0.2	17.3	2
43014	12	V	250	20/ 75	11	0	9	11.4	1.5	19.0	2
58968	12	V	250	25/ 122	29	1	13	4.1	0.1	15.8	1
60360	12	V	200	37/ 8	13	0	15	-4.5	-6.0	15.1	1
60680	12	V	150	23/ 6	11	0	0	12.1	-2.5	19.0	2
78806	00	V	100	9/ -80	10	0	20	8.7	-4.8	16.0	1

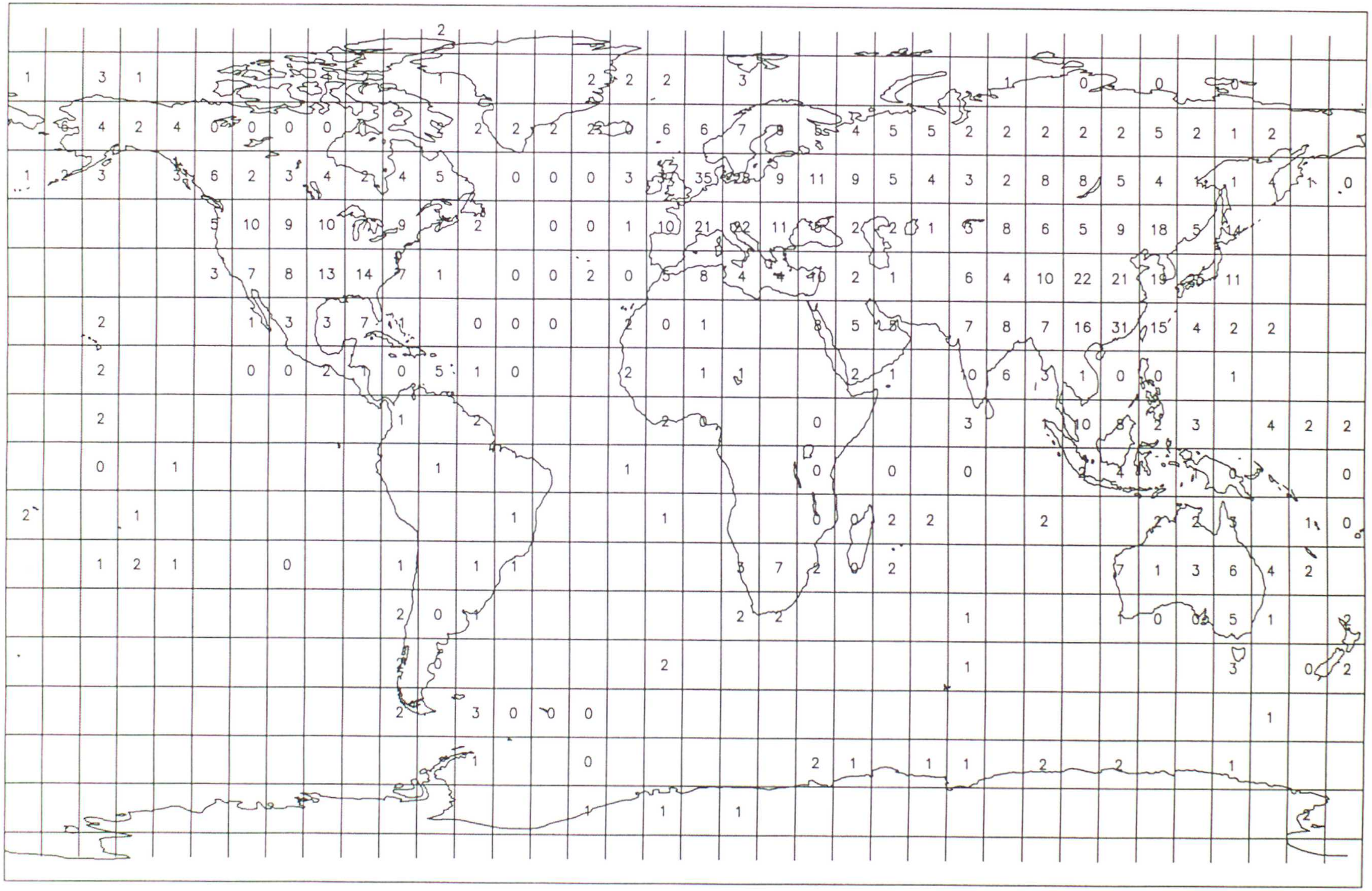
AVAILABILITY – TEMP/PILOT – 300 HPA WIND – DECEMBER 1997

FIGURE 9

ALL HOURS

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS – 1070


2
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1 2 3 3 6 2 3 4 2 4 5 0 0 0 3 3 35 28 9 11 9 5 4 3 2 8 8 5 4 1 1 4 1 0
5 10 9 10 9 2 0 0 1 10 21 22 11 6 2 2 1 3 8 6 5 9 18 5 14
3 7 8 13 14 7 1 0 0 2 0 5 8 4 4 10 2 1 6 4 10 22 21 19 11
2 1 3 3 7 1 0 0 0 2 0 1 8 5 5 7 8 7 16 31 15 4 2 2
2 0 0 2 0 5 1 0 2 1 1 2 1 0 6 3 1 0 0 1
2 1 2 2 0 0 3 10 8 2 3 4 2 2
0 1 1 1 0 0 0 4 0 0
2 1 1 1 0 0 2 2 2 2 2 3 1 0
1 2 1 0 1 1 1 3 7 2 0 2 7 1 3 6 4 2
2 0 1 2 2 1 1 0 0 5 1 2
2 1 3 0 2
2 3 0 0 0 1
1 0 2 1 1 1 2 2 1
1 1 1 2

TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: December, 1997

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from Bracknell global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 500.0 - 150.0 hPa

Element monitored :WIND DIRECTION in degrees

Parameters monitored

:NUM OBS :Average number of observations at all levels.

:BIAS :Mean difference of observations from background values from all levels.

:MAX SPREAD :(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels

:SD :SD of difference of observations from background values at all levels.

SELECTION CRITERIA :NUM OBS ≥ 5, and
ABSOLUTE BIAS ≥ 10°, with
SD < 30°, and
MAX SPREAD < 10°

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
25399	00	DD	66/-170	21	10.0	7.4	20.1
42339	00	DD	26/ 73	24	15.2	3.4	7.7
42339	12	DD	26/ 73	22	14.0	1.8	6.7
42369	12	DD	27/ 81	22	11.2	4.8	9.1
42397	00	DD	27/ 88	23	13.7	4.5	12.2
42397	12	DD	27/ 88	23	14.4	2.0	12.5
60571	12	DD	32/ -2	10	13.8	7.6	15.4
62306	00	DD	31/ 27	26	-11.7	4.2	11.0
62306	12	DD	31/ 27	25	-12.8	1.9	9.9
76679	00	DD	19/ -99	21	14.4	5.4	16.2
83780	12	DD	-24/ -47	10	-10.1	9.5	26.4
91217	00	DD	14/ 145	10	-12.1	5.4	18.6
91334	00	DD	7/ 152	20	-15.1	4.1	26.7
91334	12	DD	7/ 152	19	-17.7	8.4	24.9

MONITORING OF SATELLITE WINDS

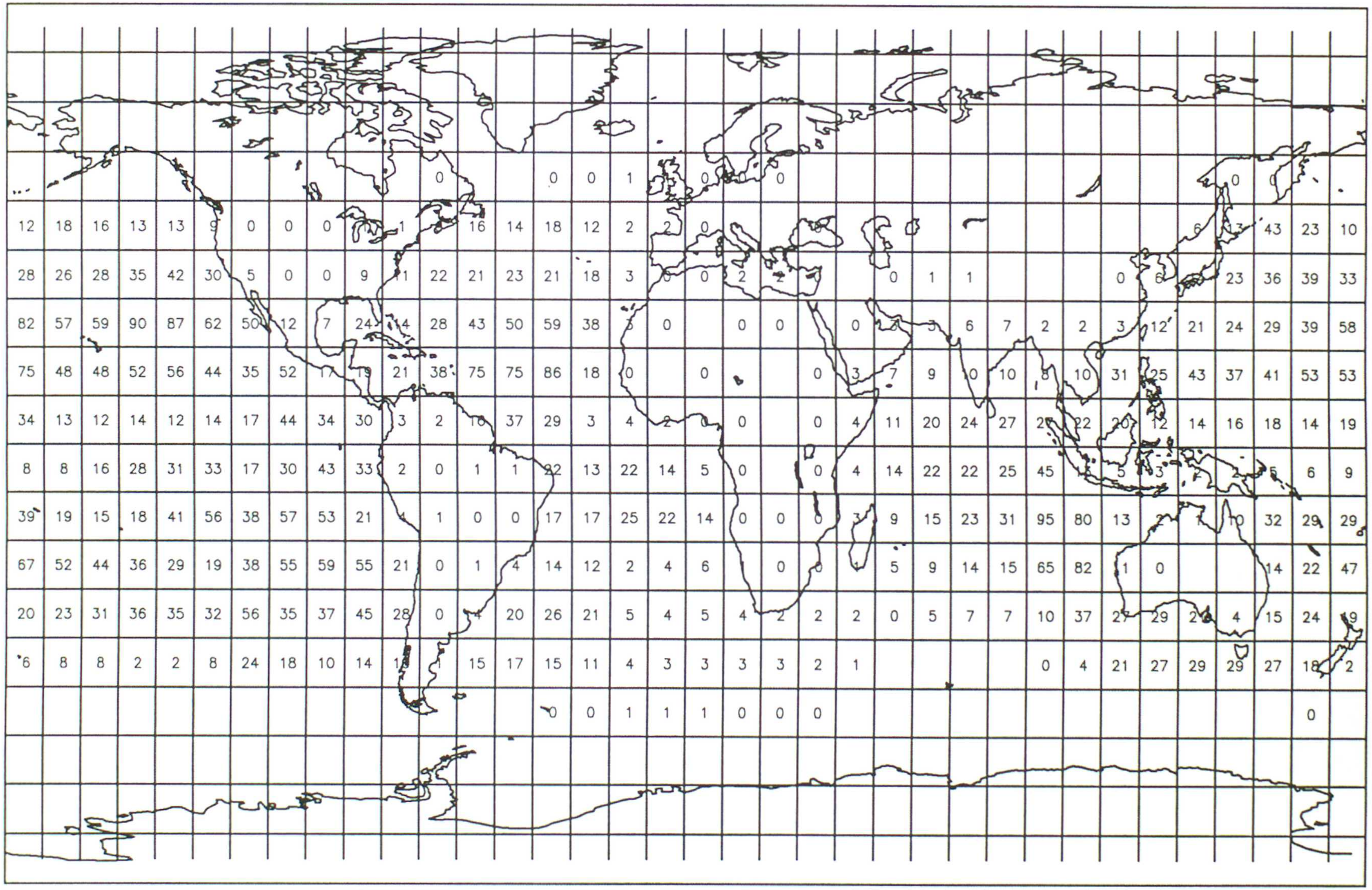
MONITORING CENTRE: BRACKNELL

MONTH: December, 1997

Monitoring procedures

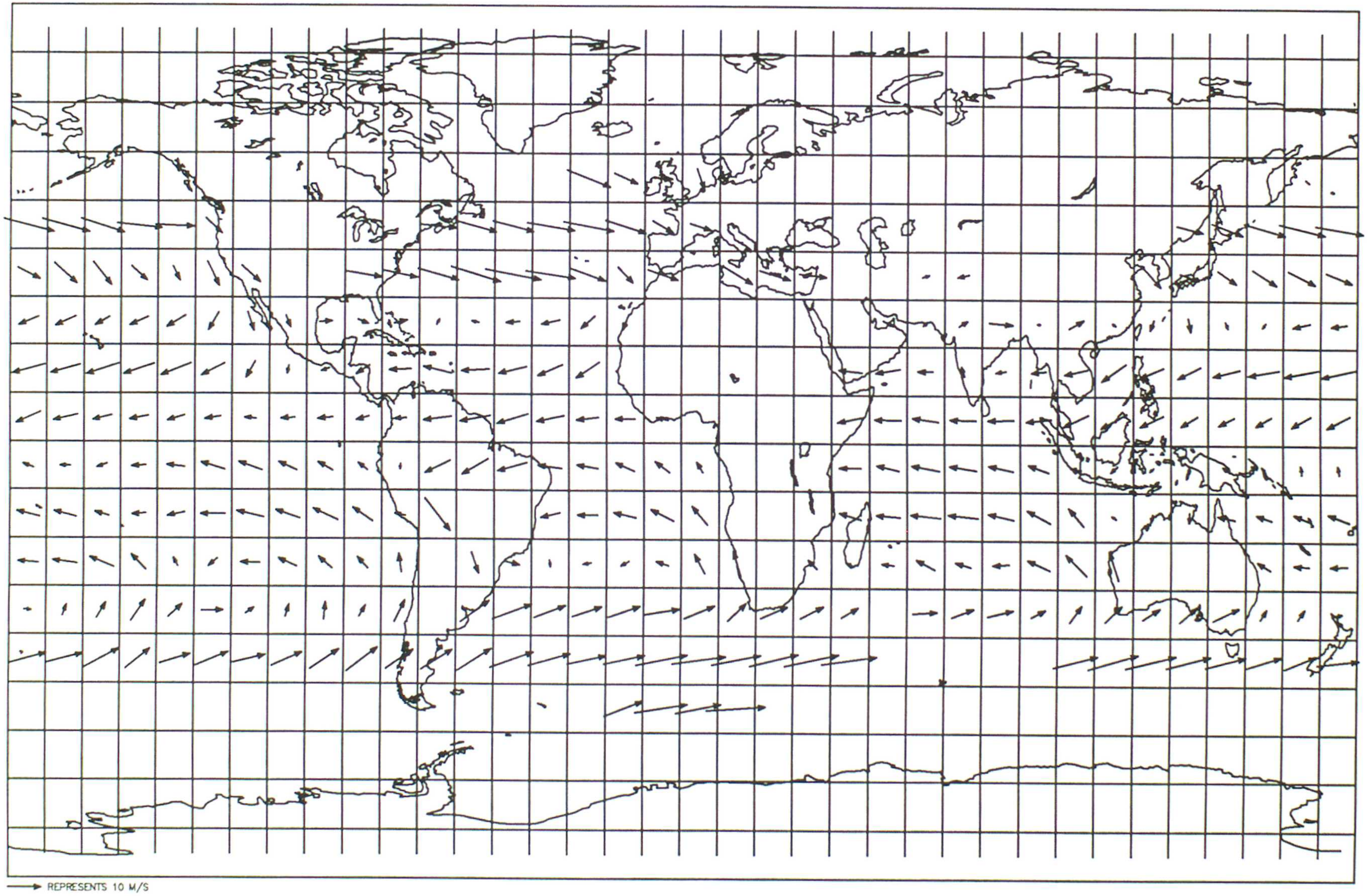
Period	:One calendar month.
Data monitored	:Reports from GOES, METEOSAT, GMS, INSAT.
Standard of comparison	:Background field from Bracknell global model.
Selection Criteria	:number of observations > 10.
Data Extracted	:Layer 701 - 1000 hPa 401 - 700 hPa 101 - 400 hPa
	:Mean wind
	:Mean observation minus background vector wind differences
	:Mean observation minus background speed differences
	:RMS of observation minus background vector differences

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 701 AND 1000 HPA FIGURE 10
DECEMBER 1997


0 0 0 1 0 0 0 0 0
12 18 16 13 13 9 0 0 0 11 1 16 14 18 12 2 2 0 0 6 13 43 23 10
28 26 28 35 42 30 5 0 0 9 11 22 21 23 21 18 3 0 0 2 2 0 0 1 1 0 6 23 36 39 33
82 57 59 90 87 62 50 12 7 24 14 28 43 50 59 38 3 0 0 0 0 3 3 6 7 2 2 3 12 21 24 29 39 58
75 48 48 52 56 44 35 52 17 19 21 38 75 75 86 18 0 0 0 3 7 9 10 10 8 10 31 25 43 37 41 53 53
34 13 12 14 12 14 17 44 34 30 3 2 16 37 29 3 4 2 0 0 0 4 11 20 24 27 27 22 20 12 14 16 18 14 19
8 8 16 28 31 33 17 30 43 33 2 0 1 1 22 13 22 14 5 0 0 4 14 22 22 25 45 13 5 3 2 2 5 6 9
39 19 15 18 41 56 38 57 53 21 4 1 0 0 17 17 25 22 14 0 0 0 3 9 15 23 31 95 80 13 2 1 10 32 29 29
67 52 44 36 29 19 38 55 59 55 21 0 1 4 14 12 2 4 6 1 0 0 1 5 9 14 15 65 82 1 0 14 22 47
20 23 31 36 35 32 56 35 37 45 28 0 4 20 26 21 5 4 5 4 2 2 2 0 5 7 7 10 37 27 29 24 4 15 24 19
6 8 8 2 2 8 24 18 10 14 18 1 15 17 15 11 4 3 3 3 3 2 1 0 4 21 27 29 29 27 18 2
0 0 1 1 1 0 0 0 0

SATOB VECTOR MEAN WINDS BETWEEN 701-1000 HPA
DECEMBER 1997
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 11


REPRESENTS 10 M/S

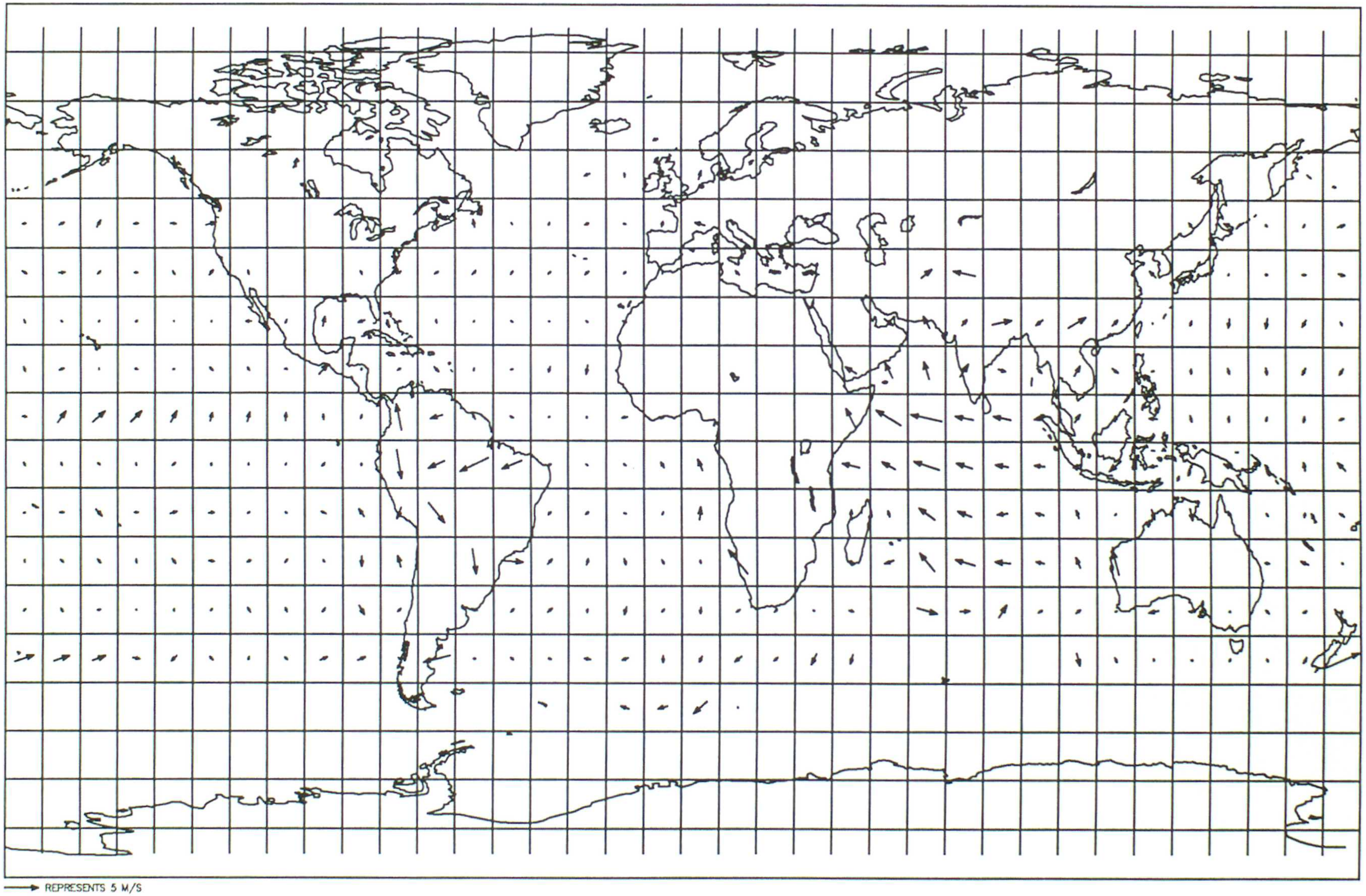
SATOB O–B VECTOR WIND DIFFERENCES BETWEEN 701–1000 HPA

DECEMBER 1997

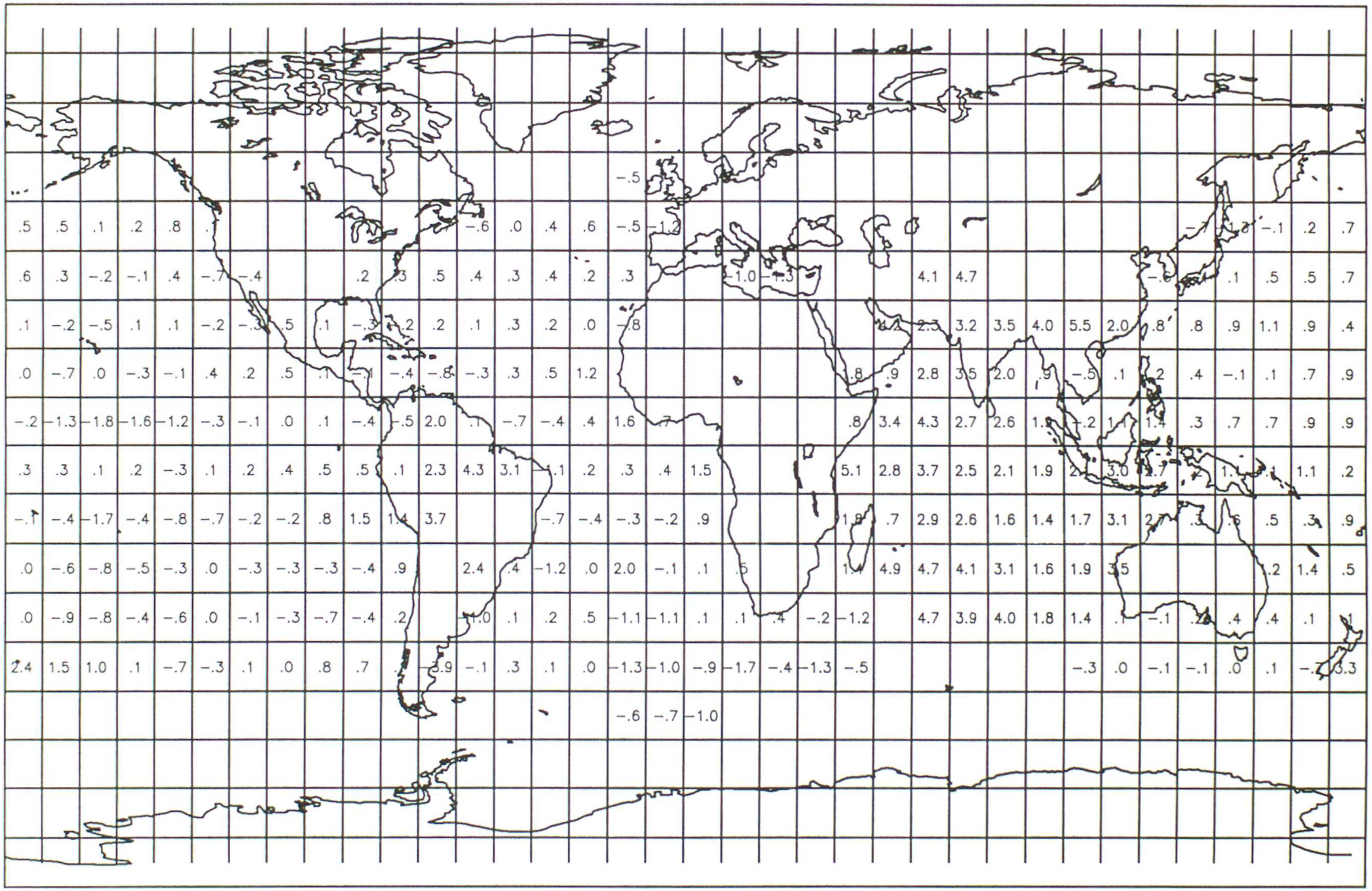
ALL OBSERVATIONS

ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

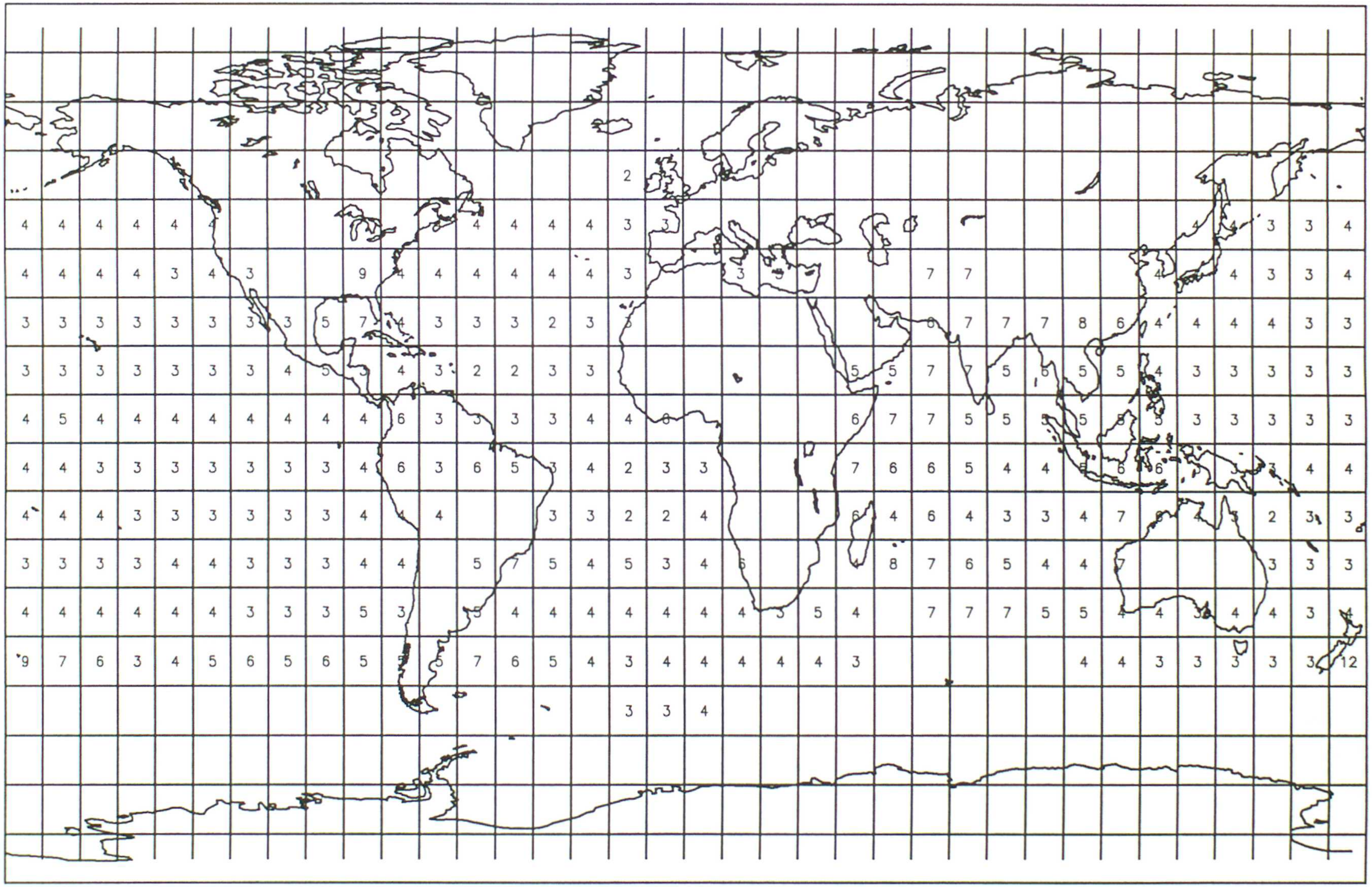
FIGURE 12



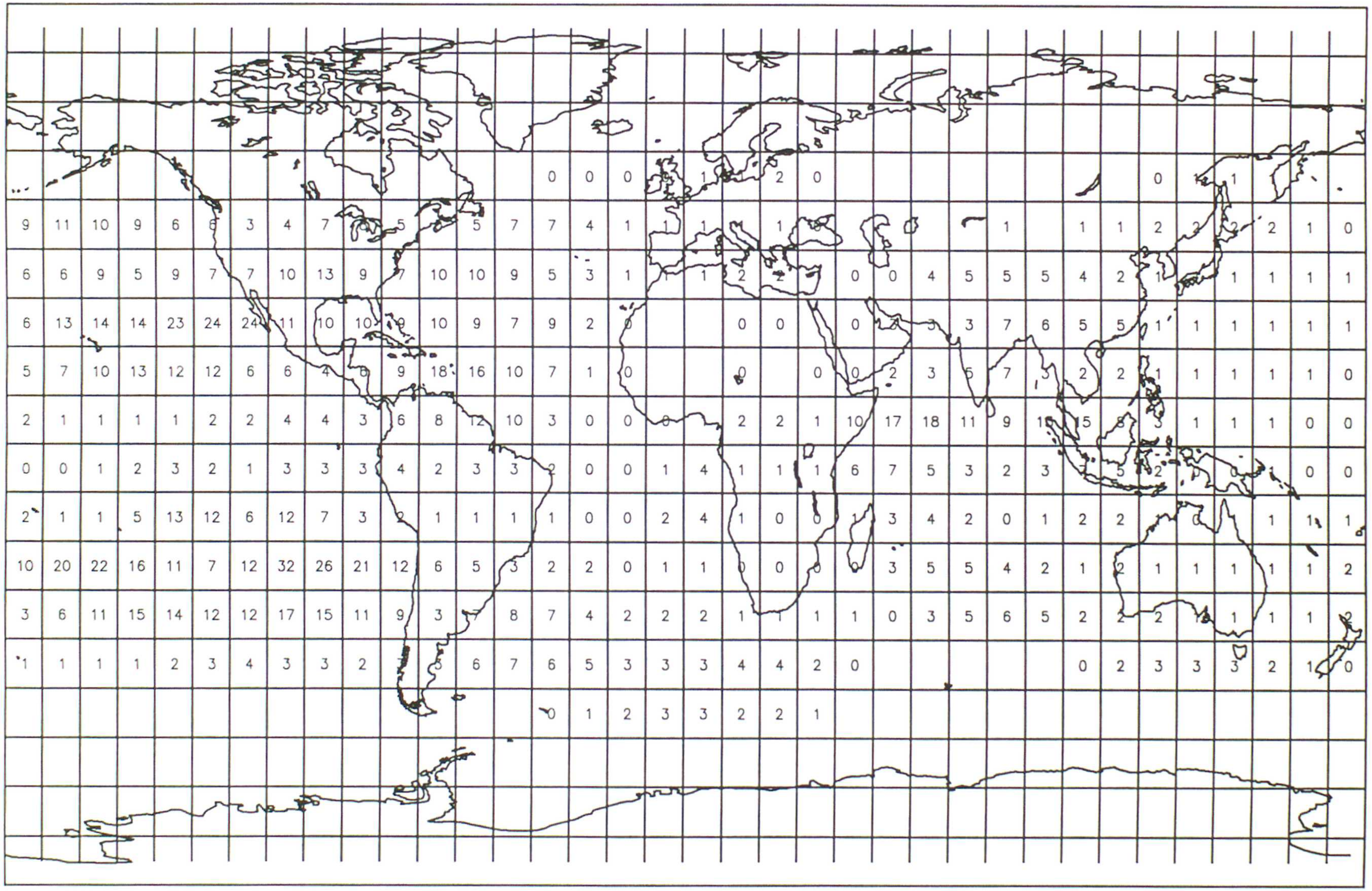
SATOBS : MEAN O–B SPEED DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 13
DECEMBER 1997
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


–.5
.5 .5 .1 .2 .8 .1 –.7 –.6 .0 .4 .6 –.5 –1.2 –.7 –1.3 –.1 .2 .7
.6 .3 –.2 –.1 .4 –.7 –.4 .2 .3 .5 .4 .3 .4 .2 .3 –1.0 –1.3 4.1 4.7 –.6 .1 .5 .5 .7
.1 –.2 –.5 .1 .1 –.2 –.3 .5 .1 –.3 –.2 .2 .1 .3 .2 .0 –.8 1.2 2.3 3.2 3.5 4.0 5.5 2.0 .8 .8 .9 1.1 .9 .4
.0 –.7 .0 –.3 –.1 .4 .2 .5 .1 –.1 –.4 –.8 –.3 .3 .5 1.2 .8 .9 2.8 3.5 2.0 .9 –.5 .1 .2 .4 –.1 .1 .7 .9
–.2 –1.3 –1.8 –1.6 –1.2 –.3 –.1 .0 .1 –.4 –.5 2.0 .1 –.7 –.4 .4 1.6 .7 .8 3.4 4.3 2.7 2.6 1.5 –.2 1.1 1.4 .3 .7 .7 .9 .9
.3 .3 .1 .2 –.3 .1 .2 .4 .5 .5 .1 2.3 4.3 3.1 –.1 .2 .3 .4 1.5 5.1 2.8 3.7 2.5 2.1 1.9 2.1 3.0 2.7 .2 1.1 .1 1.1 .2
–.1 –.4 –1.7 –.4 –.8 –.7 –.2 –.2 .8 1.5 1.4 3.7 –.7 –.4 –.3 –.2 .9 1.8 .7 2.9 2.6 1.6 1.4 1.7 3.1 2.7 .3 .6 .5 .3 .9
.0 –.6 –.8 –.5 –.3 .0 –.3 –.3 –.3 –.4 .9 2.4 .4 –1.2 .0 2.0 –.1 .1 .5 1.4 4.9 4.7 4.1 3.1 1.6 1.9 3.5 .2 1.4 .5
.0 –.9 –.8 –.4 –.6 .0 –.1 –.3 –.7 –.4 .2 –1.0 .1 .2 .5 –1.1 –1.1 .1 .1 .4 –.2 –1.2 4.7 3.9 4.0 1.8 1.4 .1 –.1 .2 .4 .4 .1 .1
2.4 1.5 1.0 .1 –.7 –.3 .1 .0 .8 .7 –3.9 –.1 .3 .1 .0 –1.3 –1.0 –.9 –1.7 –.4 –1.3 –.5 –.3 .0 –.1 –.1 .0 .1 –.7 3.3
–.6 –.7 –1.0

SATOBS : RMS O–B VECTOR DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 14
DECEMBER 1997
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT

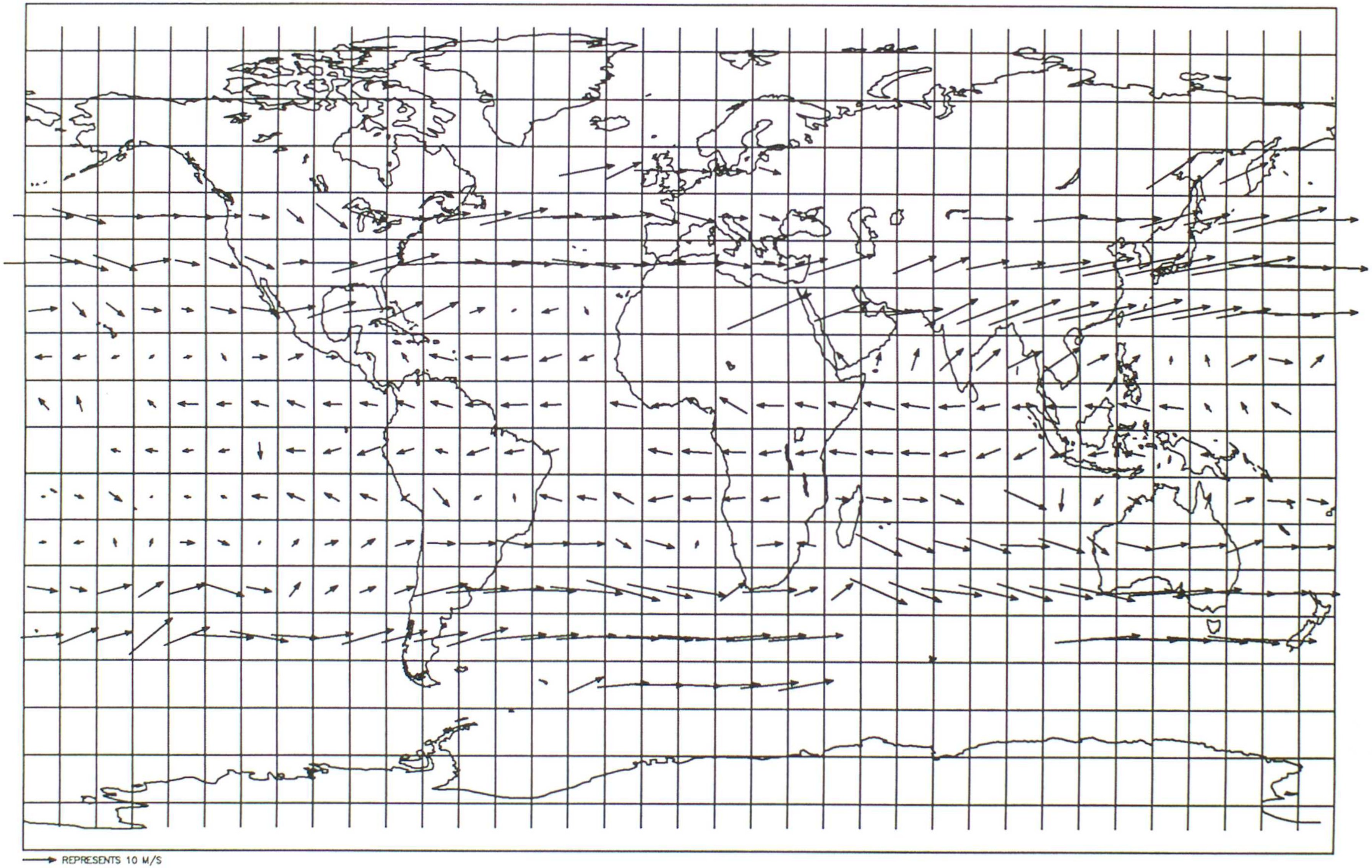


AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 401 AND 700 HPA FIGURE 15
DECEMBER 1997


0 0 0 0 1 1 2 0 0 1 1
9 11 10 9 6 6 3 4 7 0 5 5 7 7 4 1 1 1 1 1 0 1 1 1 2 2 2 2 1 0
6 6 9 5 9 7 7 10 13 9 7 10 10 9 5 3 1 1 1 2 2 0 0 4 5 5 5 4 2 1 1 1 1 1
6 13 14 14 23 24 24 11 10 10 9 10 9 7 9 2 0 0 0 0 3 3 3 7 6 5 5 1 1 1 1 1 1
5 7 10 13 12 12 6 6 4 6 9 18 16 10 7 1 0 0 0 0 2 3 5 7 3 2 2 1 1 1 1 1 0
2 1 1 1 1 2 2 4 4 3 6 8 12 10 3 0 0 0 2 2 1 10 17 18 11 9 16 15 8 3 1 1 1 0 0
0 0 1 2 3 2 1 3 3 3 4 2 3 3 2 0 0 1 4 1 1 1 6 7 5 3 2 3 7 5 2 0 0 1 0 0
2 1 1 5 13 12 6 12 7 3 2 1 1 1 1 0 0 2 4 1 0 0 1 3 4 2 0 1 2 2 1 0 1 1 1
10 20 22 16 11 7 12 32 26 21 12 6 5 3 2 2 0 1 1 0 0 0 0 3 5 5 4 2 1 2 1 1 1 1 1 2
3 6 11 15 14 12 12 17 15 11 9 3 7 8 7 4 2 2 2 1 1 1 1 0 3 5 6 5 2 2 2 1 1 1 1 2
1 1 1 1 2 3 4 3 3 2 3 3 6 7 6 5 3 3 3 4 4 2 0 0 2 3 3 3 2 1 0
0 1 2 3 3 2 2 1

SATOB VECTOR MEAN WINDS BETWEEN 401–700 HPA
DECEMBER 1997
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 16


→ REPRESENTS 10 M/S

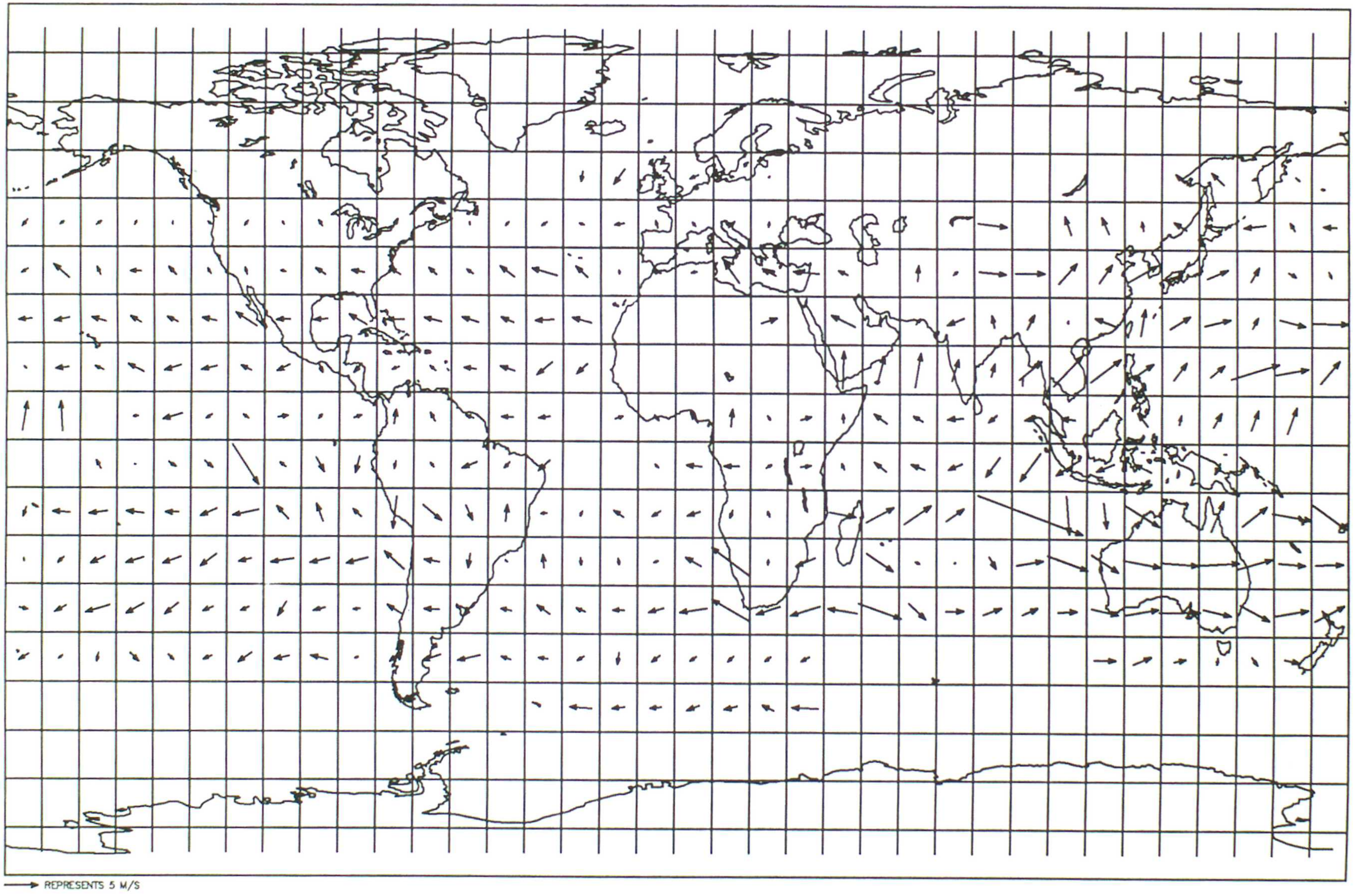
SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 401-700 HPA

DECEMBER 1997

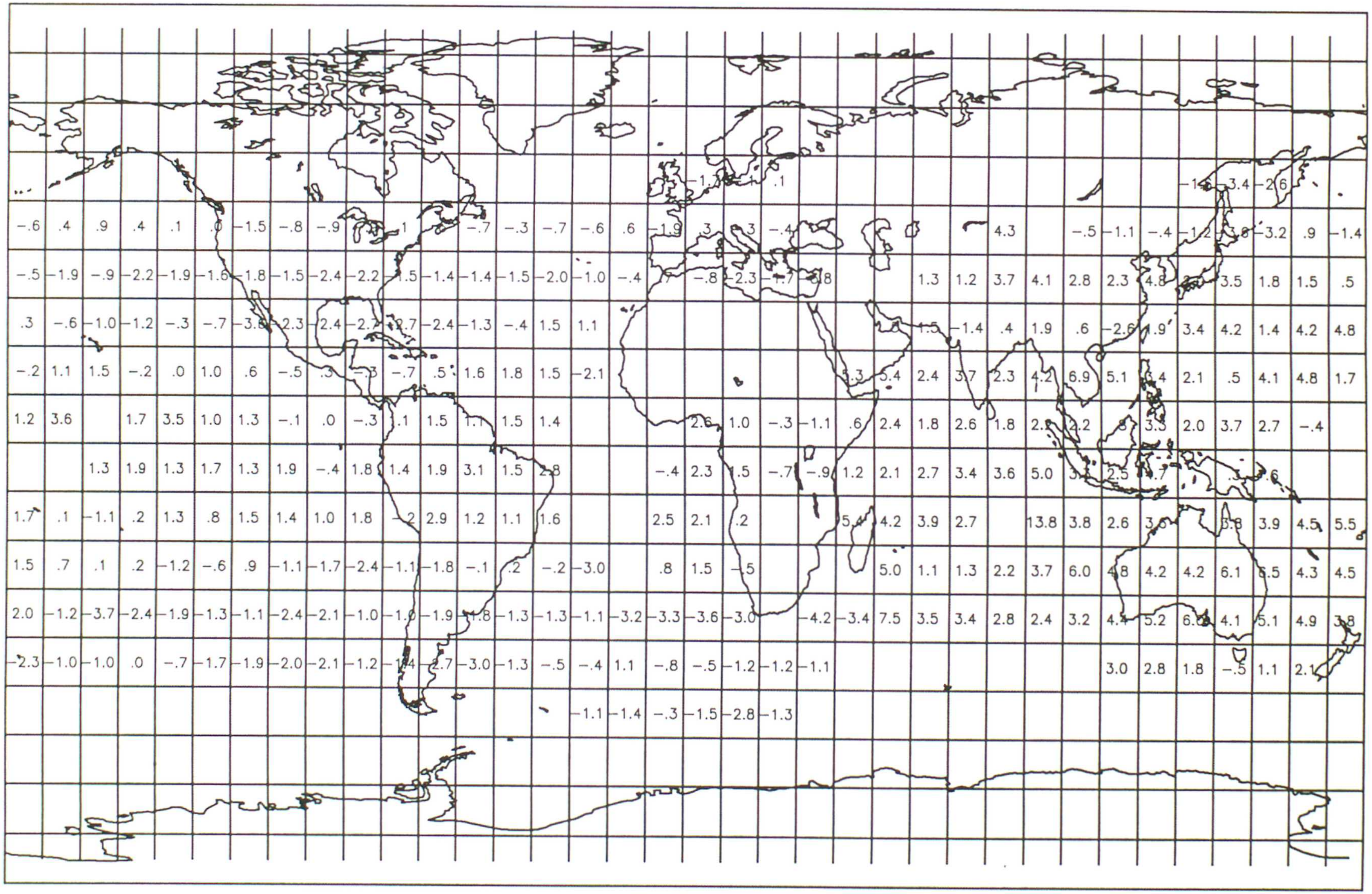
ALL OBSERVATIONS

ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

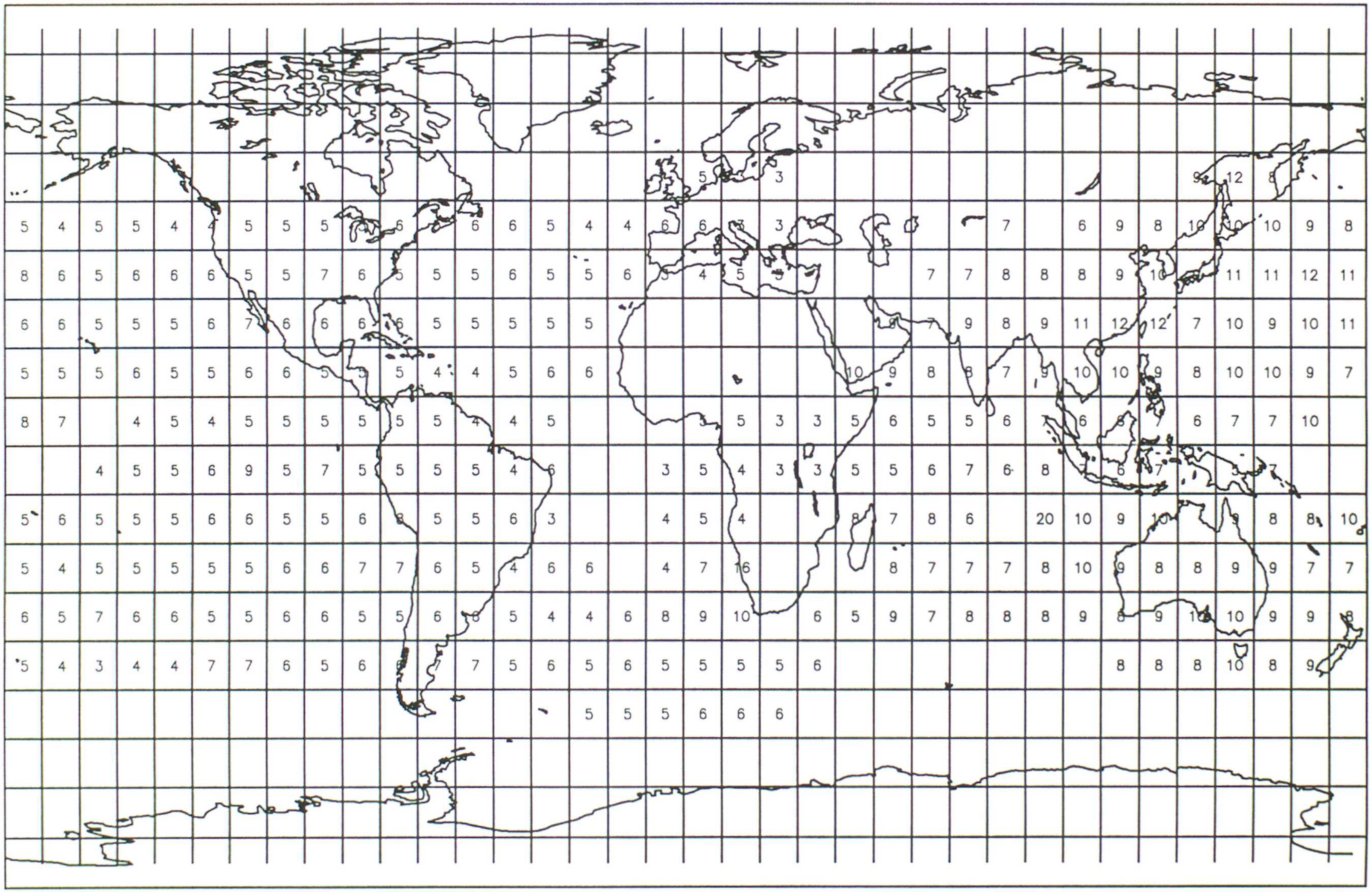
FIGURE 17



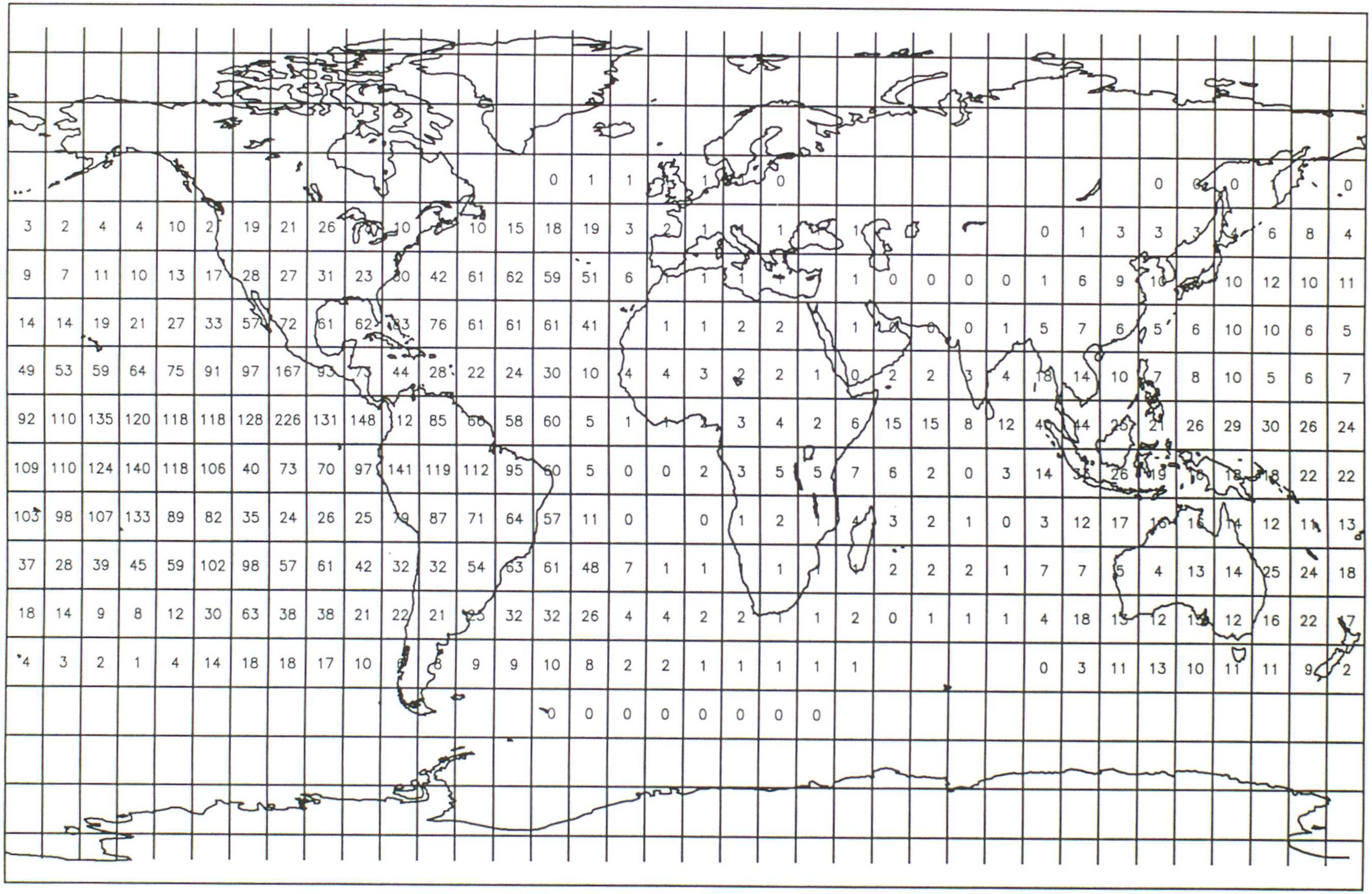
SATOBS : MEAN O–B SPEED DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 18
DECEMBER 1997
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


-1.7 -1.1 .1 -1.6 -3.4 -2.6
-.6 .4 .9 .4 .1 .0 -1.5 -.8 -.9 .1 -.7 -.3 -.7 -.6 .6 -1.9 .3 .3 -.4 4.3 -.5 -1.1 -.4 -1.2 -3.8 -3.2 .9 -1.4
-.5 -1.9 -.9 -2.2 -1.9 -1.6 -1.8 -1.5 -2.4 -2.2 -1.5 -1.4 -1.4 -1.5 -2.0 -1.0 -.4 .7 -.8 -2.3 -1.7 -3.8 1.3 1.2 3.7 4.1 2.8 2.3 4.8 3.5 1.8 1.5 .5
.3 -.6 -1.0 -1.2 -.3 -.7 -3.8 -2.3 -2.4 -2.7 -2.7 -2.4 -1.3 -.4 1.5 1.1 1.5 -1.4 .4 1.9 .6 -2.6 1.9 3.4 4.2 1.4 4.2 4.8
-.2 1.1 1.5 -.2 .0 1.0 .6 -.5 .3 -.3 -.7 .5 1.6 1.8 1.5 -2.1 5.3 5.4 2.4 3.7 2.3 4.2 6.9 5.1 3.4 2.1 .5 4.1 4.8 1.7
1.2 3.6 1.7 3.5 1.0 1.3 -.1 .0 -.3 .1 1.5 1.1 1.5 1.4 2.6 1.0 -.3 -1.1 .6 2.4 1.8 2.6 1.8 2.2 .8 3.3 2.0 3.7 2.7 -.4
1.3 1.9 1.3 1.7 1.3 1.9 -.4 1.8 1.4 1.9 3.1 1.5 2.8 -.4 2.3 1.5 -.7 -.9 1.2 2.1 2.7 3.4 3.6 5.0 2.5
1.7 .1 -1.1 .2 1.3 .8 1.5 1.4 1.0 1.8 -.2 2.9 1.2 1.1 1.6 2.5 2.1 .2 5.4 4.2 3.9 2.7 13.8 3.8 2.6 3.6 3.8 3.9 4.5 5.5
1.5 .7 .1 .2 -1.2 -.6 .9 -1.1 -1.7 -2.4 -1.1 -1.8 -.1 .2 -.2 -3.0 .8 1.5 -.5 5.0 1.1 1.3 2.2 3.7 6.0 4.8 4.2 4.2 6.1 6.5 4.3 4.5
2.0 -1.2 -3.7 -2.4 -1.9 -1.3 -1.1 -2.4 -2.1 -1.0 -1.0 -1.9 -1.8 -1.3 -1.3 -1.1 -3.2 -3.3 -3.6 -3.0 -4.2 -3.4 7.5 3.5 3.4 2.8 2.4 3.2 4.4 5.2 4.1 5.1 4.9 3.8
-2.3 -1.0 -1.0 .0 -.7 -1.7 -1.9 -2.0 -2.1 -1.2 -1.4 -2.7 -3.0 -1.3 -.5 -.4 1.1 -.8 -.5 -1.2 -1.2 -1.1 3.0 2.8 1.8 -.5 1.1 2.1
-1.1 -1.4 -.3 -1.5 -2.8 -1.3

SATOBS : RMS O–B VECTOR DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 1
DECEMBER 1997
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


5 3 9 12 8
5 4 5 5 4 4 5 5 5 5 6 6 6 5 4 4 6 6 3 3 7 6 9 8 10 10 10 9 8
8 6 5 6 6 6 5 5 7 6 5 5 5 6 5 5 6 5 4 5 5 7 7 8 8 8 9 10 11 11 12 11
6 6 5 5 5 6 7 6 6 6 6 5 5 5 5 5 9 7 9 8 9 11 12 12 7 10 9 10 11
5 5 5 6 5 5 6 6 5 3 5 4 4 5 6 6 10 9 8 8 7 9 10 10 9 8 10 10 9 7
8 7 4 5 4 5 5 5 5 5 5 4 4 5 3 5 3 3 5 6 5 5 6 6 6 6 7 7 10
4 5 5 6 9 5 7 5 5 5 5 4 6 3 5 4 3 3 5 5 6 7 6 8 6 7 7
5 6 5 5 5 6 6 5 5 6 8 5 5 6 3 4 5 4 8 7 8 6 20 10 9 10 9 8 8 10
5 4 5 5 5 5 5 6 6 7 7 6 5 4 6 6 4 7 16 8 7 7 7 8 10 9 8 8 9 9 7 7
6 5 7 6 6 5 5 6 6 5 5 6 8 5 4 4 6 8 9 10 6 5 9 7 8 8 8 9 8 9 10 10 9 9 8
5 4 3 4 4 7 7 6 5 6 6 7 7 5 6 5 6 5 5 5 5 6 8 8 8 10 8 9
5 5 5 6 6 6

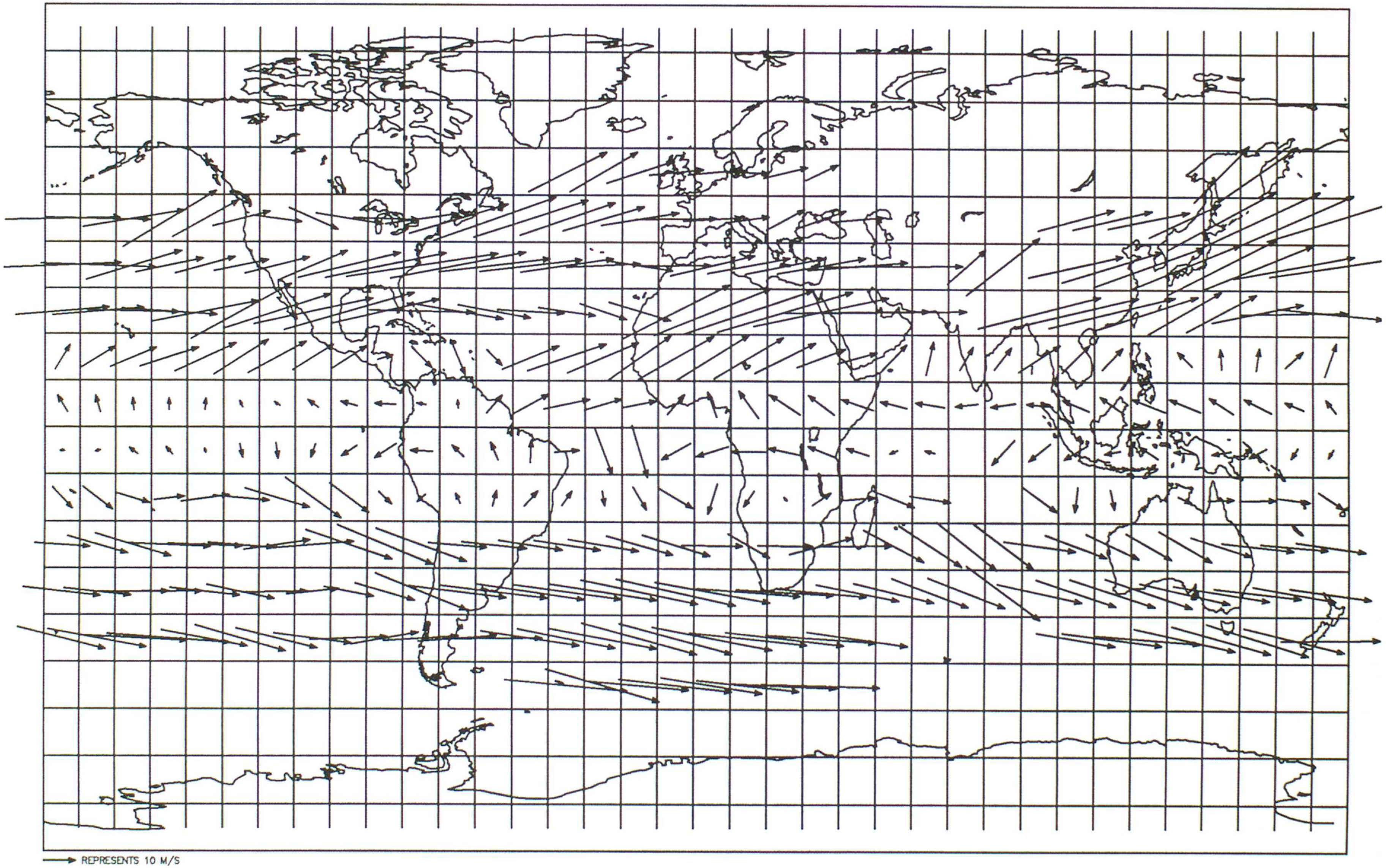
AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 101 AND 400 HPA FIGURE 20
DECEMBER 1997



														0	1	1		1		0										0	0	0			0
3	2	4	4	10	2	19	21	26	[illegible]	10		10	15	18	19	3	2	1	1	1	1	1					0	1	3	3	3	4	6	8	4
9	7	11	10	13	17	28	27	31	23	30	42	61	62	59	51	6	1	1	1	1		1	0	0	0	0	1	6	9	10		10	12	10	11
14	14	19	21	27	33	57	72	61	62	83	76	61	61	61	41	1	1	1	2	2		1	0	0	0	1	5	7	6	5	6	10	10	6	5
49	53	59	64	75	91	97	167	93	73	44	28	22	24	30	10	4	4	3	2	2	1	0	2	2	3	4	18	14	10	7	8	10	5	6	7
92	110	135	120	118	118	128	226	131	148	12	85	66	58	60	5	1	1	2	3	4	2	6	15	15	8	12	40	44	25	21	26	29	30	26	24
109	110	124	140	118	106	40	73	70	97	141	119	112	95	60	5	0	0	2	3	5	5	7	6	2	0	3	14	35	26	19	16	18	18	22	22
103	98	107	133	89	82	35	24	26	25	79	87	71	64	57	11	0		0	1	2	1	4	3	2	1	0	3	12	17	16	16	14	12	11	13
37	28	39	45	59	102	98	57	61	42	32	32	54	63	61	48	7	1	1		1	1	1	2	2	2	1	7	7	5	4	13	14	25	24	18
18	14	9	8	12	30	63	38	38	21	22	21	25	32	32	26	4	4	2	2	1	1	2	0	1	1	1	4	18	13	12	13	12	16	22	17
4	3	2	1	4	14	18	18	17	10	6	8	9	9	10	8	2	2	1	1	1	1	1					0	3	11	13	10	11	11	9	2
														0	0	0	0	0	0	0	0														

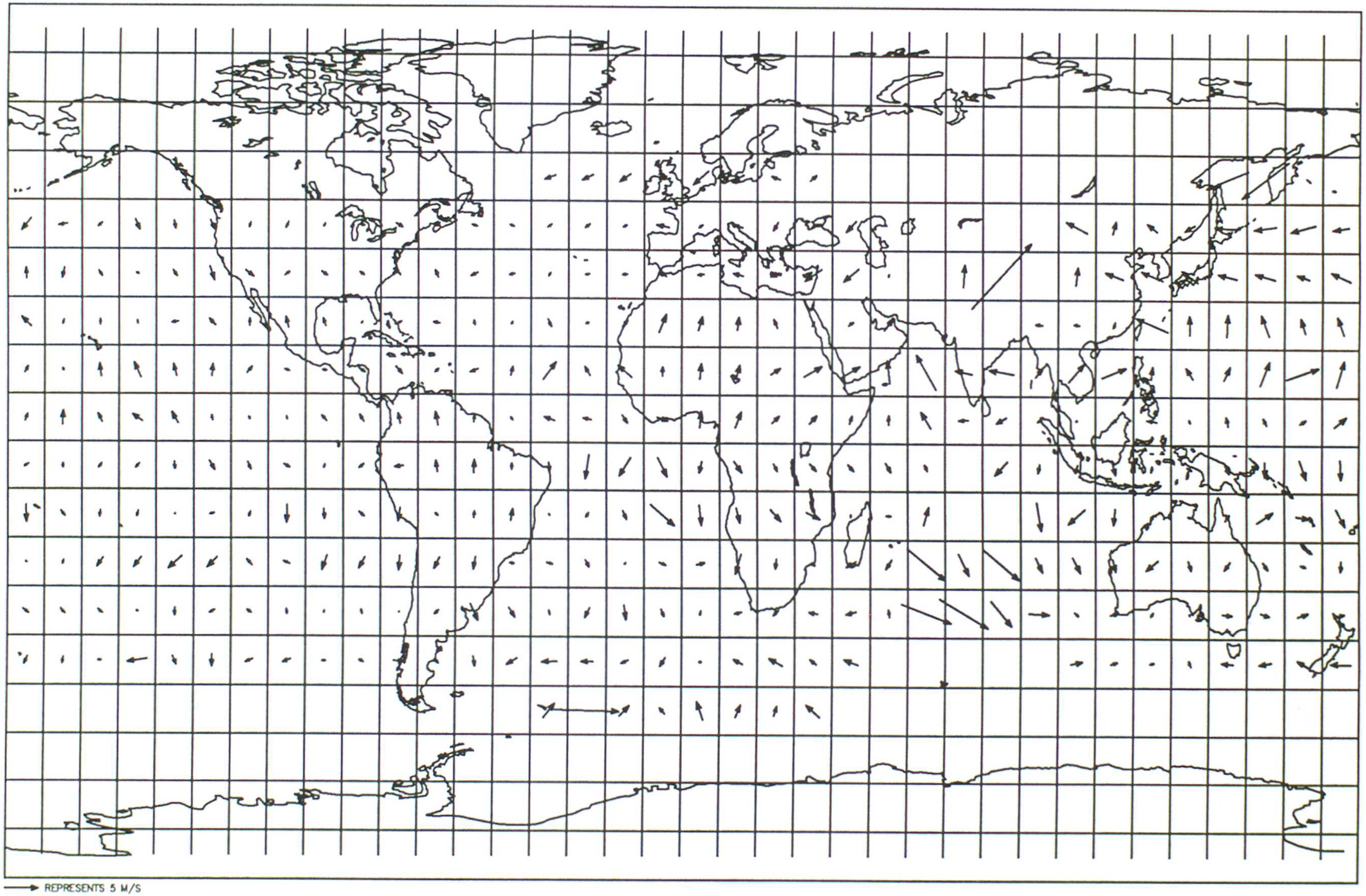
SATOB VECTOR MEAN WINDS BETWEEN 101-[illegible]0 HPA
DECEMBER 1997
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 21

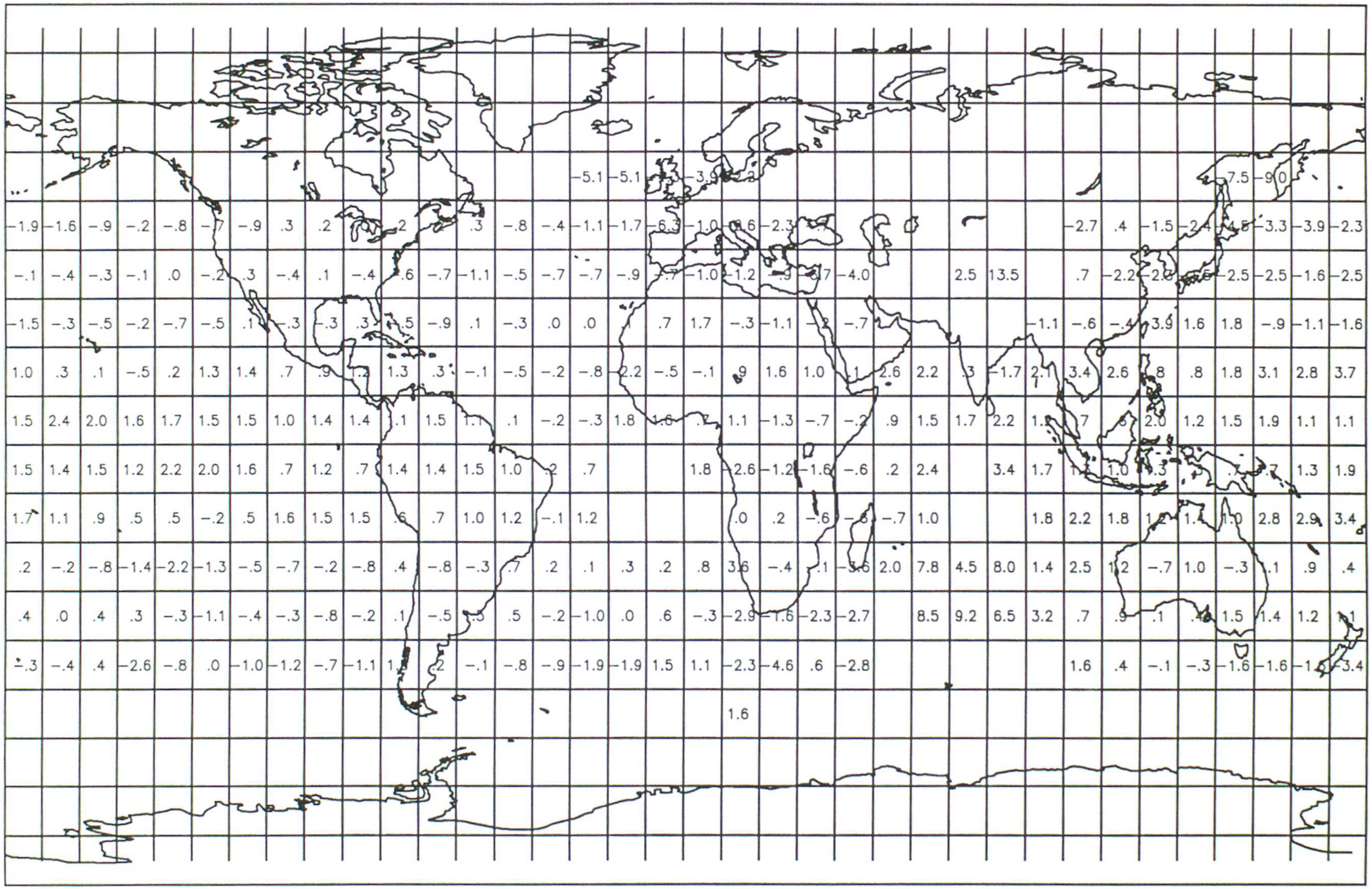

REPRESENTS 10 M/S

SATOB O–B VECTOR WIND DIFFERENCES BETWEEN 101–400 HPA
DECEMBER 1997
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

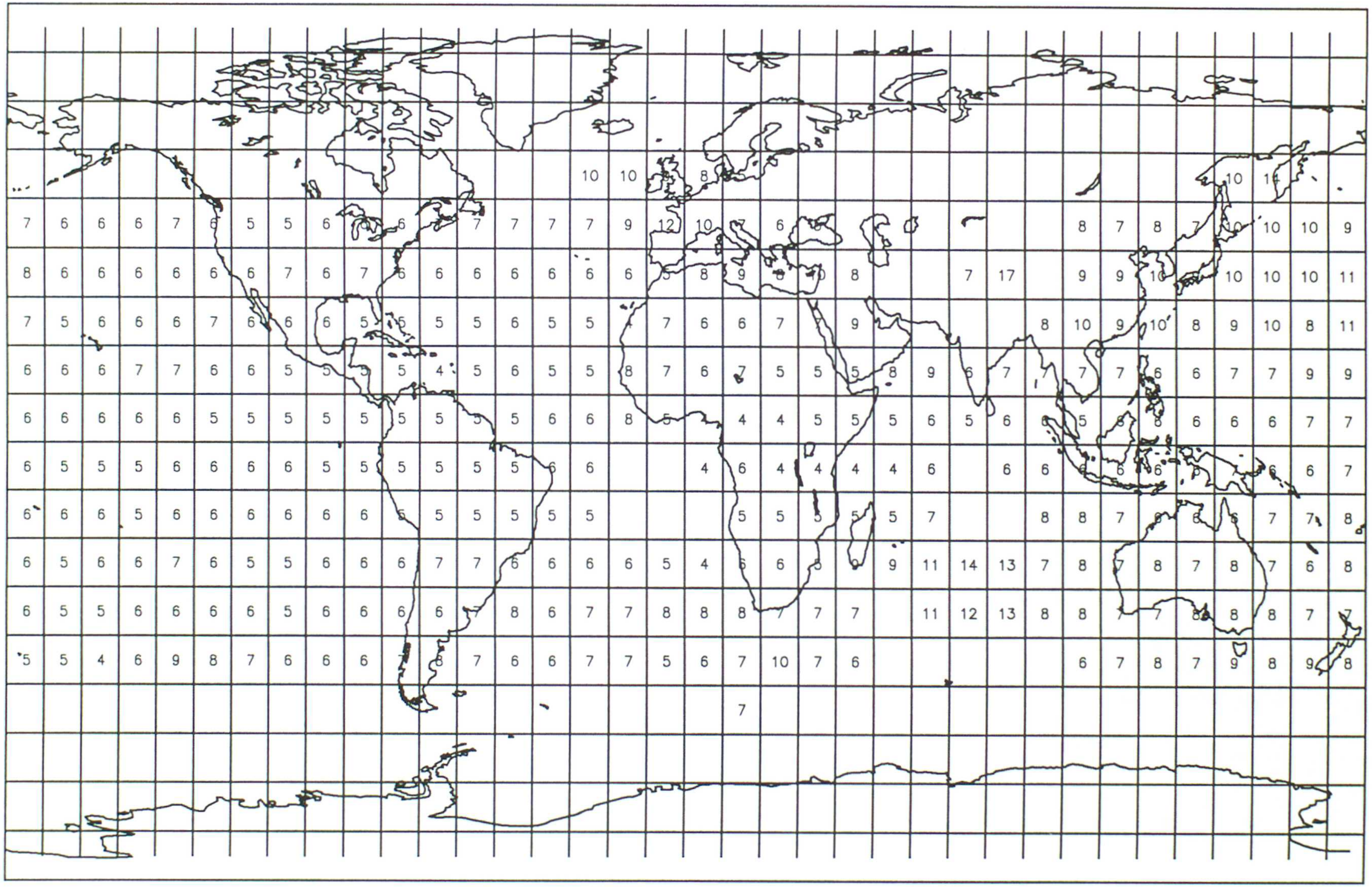
FIGURE 22



SATOBS : MEAN O–B SPEED DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 2
DECEMBER 1997
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


-5.1 -5.1 -3.9 -7.5 -9.0
-1.9 -1.6 -.9 -.2 -.8 -.7 -.9 .3 .2 .2 .3 -.8 -.4 -1.1 -1.7 -6.3 -1.0 -.6 -2.3 -2.7 .4 -1.5 -2.4 -4.5 -3.3 -3.9 -2.3
-.1 -.4 -.3 -.1 .0 -.2 .3 -.4 .1 -.4 .6 -.7 -1.1 -.5 -.7 -.7 -.9 -.7 -1.0 -1.2 -.9 -.7 -4.0 2.5 13.5 .7 -2.2 -2.6 -.5 -2.5 -2.5 -1.6 -2.5
-1.5 -.3 -.5 -.2 -.7 -.5 .1 -.3 -.3 .3 -.5 -.9 .1 -.3 .0 .0 .1 .7 1.7 -.3 -1.1 -.2 -.7 -1.1 -.6 -.4 -3.9 1.6 1.8 -.9 -1.1 -1.6
1.0 .3 .1 -.5 .2 1.3 1.4 .7 .9 .2 1.3 .3 -.1 -.5 -.2 -.8 -2.2 -.5 -.1 .9 1.6 1.0 .1 2.6 2.2 .3 -1.7 2.1 3.4 2.6 .8 .8 1.8 3.1 2.8 3.7
1.5 2.4 2.0 1.6 1.7 1.5 1.5 1.0 1.4 1.4 .1 1.5 1.1 .1 -.2 -.3 1.8 1.6 .7 1.1 -1.3 -.7 -.2 .9 1.5 1.7 2.2 1.5 .7 .6 2.0 1.2 1.5 1.9 1.1 1.1
1.5 1.4 1.5 1.2 2.2 2.0 1.6 .7 1.2 .7 1.4 1.4 1.5 1.0 .2 .7 1.8 -2.6 -1.2 -1.6 -.6 .2 2.4 3.4 1.7 1.1 1.0 1.3 .7 1.3 1.9
1.7 1.1 .9 .5 .5 -.2 .5 1.6 1.5 1.5 .6 .7 1.0 1.2 -.1 1.2 .0 .2 -.6 -.8 -.7 1.0 1.8 2.2 1.8 1.2 1.4 1.0 2.8 2.9 3.4
.2 -.2 -.8 -1.4 -2.2 -1.3 -.5 -.7 -.2 -.8 .4 -.8 -.3 .7 .2 .1 .3 .2 .8 3.6 -.4 -.1 -3.6 2.0 7.8 4.5 8.0 1.4 2.5 1.2 -.7 1.0 -.3 .1 .9 .4
.4 .0 .4 .3 -.3 -1.1 -.4 -.3 -.8 -.2 .1 -.5 .5 .5 -.2 -1.0 .0 .6 -.3 -2.9 -1.6 -2.3 -2.7 8.5 9.2 6.5 3.2 .7 .9 .1 .4 1.5 1.4 1.2 .1
-.3 -.4 .4 -2.6 -.8 .0 -1.0 -1.2 -.7 -1.1 1.1 .2 -.1 -.8 -.9 -1.9 -1.9 1.5 1.1 -2.3 -4.6 .6 -2.8 1.6 .4 -.1 -.3 -1.6 -1.6 -1.5 -3.4
1.6

SATOBS : RMS O–B VECTOR DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 24
DECEMBER 1997
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT



MONITORING OF SATELLITE TEMPERATURES

MONITORING CENTRE: BRACKNELL

MONTH: December, 1997

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from NOAA-11, NOAA-14 500 km.

Standard of comparison :Background field from Bracknell global model.

Selection Criteria :All SATEM soundings where number of observations > 30.

Data Extracted :Layer: 850 - 1000 hPa
100 - 300 hPa
30 - 50 hPa

:Mean observation minus background temperature differences

NO DATA AVAILABLE

TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
DATA TYPE:- DRIFTER
MONITORING CENTRE: BRACKNELL
MONTH: December, 1997

Monitoring procedures
Period :One calendar month.

Data monitored :Reports from each unique identifier for drifting buoy.

Area monitored :10°N - 80°N, 85°W - 0°W

Standard of comparison :Background field from Bracknell global model.

Position :Average latitude and longitude for period.

Observation times :All hours combined.

Elements monitored :Mean sea-level pressure (hPa)
:Wind speed (m s^{-1})
:Wind direction (degrees)

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. A positive bias indicates the observation is veered to the background

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors

GROSS ERROR LIMITS :15 hPa (pressure)
:25 m s^{-1} (Vector Wind)

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
09712	20.9	-23.6	ALL	MSLP	SUR	3	0	0	0.9	0.3	1.0
13903	26.1	-42.6	ALL	MSLP	SUR	266	0	0	0.8	1.0	1.2
13906	22.9	-55.0	ALL	MSLP	SUR	285	0	0	1.0	0.0	1.0
13910	27.6	-47.9	ALL	MSLP	SUR	285	0	0	0.9	-1.9	2.1
13912	17.7	-61.8	ALL	MSLP	SUR	279	0	0	1.1	0.7	1.3
13913	19.7	-53.7	ALL	MSLP	SUR	268	0	0	0.9	0.0	0.9
39712	25.2	-73.6	ALL	MSLP	SUR	20	0	0	1.9	-2.5	3.2
41505	20.2	-55.5	ALL	MSLP	SUR	470	0	0	0.8	0.6	1.0
41506	15.9	-54.0	ALL	MSLP	SUR	423	0	0	0.9	0.5	1.0
41522	11.4	-48.4	ALL	MSLP	SUR	344	0	0	0.9	0.7	1.2
41523	13.6	-52.6	ALL	MSLP	SUR	226	2	1	2.9	7.8	8.3
41524	14.4	-54.6	ALL	MSLP	SUR	438	0	0	0.9	0.5	1.0
41525	13.1	-41.4	ALL	MSLP	SUR	388	0	0	0.7	0.5	0.8
41924	20.0	-44.4	ALL	MSLP	SUR	263	0	0	0.9	-1.9	2.1
44609	52.9	-40.7	ALL	MSLP	SUR	670	1	0	2.0	0.3	2.0
44610	45.2	-48.6	ALL	MSLP	SUR	461	2	0	1.7	0.4	1.8
44614	55.5	-39.2	ALL	MSLP	SUR	121	0	0	2.4	0.8	2.5
44616	51.8	-42.4	ALL	MSLP	SUR	1087	3	0	1.9	0.2	1.9
44617	51.9	-46.4	ALL	MSLP	SUR	1035	3	0	1.7	-0.2	1.8
44621	53.6	-30.4	ALL	MSLP	SUR	774	6	1	1.9	-0.5	1.9
44624	60.9	-13.5	ALL	MSLP	SUR	1386	3	0	1.3	0.1	1.3
44727	57.4	-32.8	ALL	MSLP	SUR	2081	6	0	1.8	-0.1	1.8
44728	63.2	-21.7	ALL	MSLP	SUR	1460	24	2	1.4	0.4	1.5
44742	39.5	-14.9	ALL	MSLP	SUR	711	1	0	1.2	-0.3	1.2
44743	43.0	-9.5	ALL	MSLP	SUR	650	4	1	1.2	0.0	1.2
44760	35.3	-40.5	ALL	MSLP	SUR	320	0	0	1.7	0.0	1.7
44761	56.8	-38.2	ALL	MSLP	SUR	505	0	0	2.4	0.6	2.4
44762	38.1	-13.1	ALL	MSLP	SUR	693	1	0	1.0	-0.4	1.1
44763	45.5	-46.6	ALL	MSLP	SUR	615	3	0	2.1	0.4	2.2
44765	60.2	-39.3	ALL	MSLP	SUR	953	6	1	2.0	0.3	2.0
44766	52.6	-42.8	ALL	MSLP	SUR	101	0	0	2.3	0.4	2.3
44768	57.2	-27.5	ALL	MSLP	SUR	1469	4	0	1.7	0.3	1.7
44769	50.8	-21.1	ALL	MSLP	SUR	1134	2	0	1.6	-0.3	1.6
44771	52.3	-34.9	ALL	MSLP	SUR	1013	8	1	2.1	0.3	2.1
44772	50.0	-47.9	ALL	MSLP	SUR	10	1	10	0.8	-0.5	1.0
44773	60.4	-31.6	ALL	MSLP	SUR	1442	6	0	1.7	0.0	1.7
44775	59.5	-40.2	ALL	MSLP	SUR	1523	4	0	1.6	0.2	1.6
44776	49.7	-11.9	ALL	MSLP	SUR	12	11	92	0.0	5.7	5.7
44780	54.7	-40.1	ALL	MSLP	SUR	1228	5	0	1.8	-0.1	1.8
44834	50.8	-49.5	ALL	MSLP	SUR	22	0	0	1.5	1.3	2.0
44901	53.4	-50.6	ALL	MSLP	SUR	69	3	4	1.4	1.2	1.9
44911	58.1	-12.5	ALL	MSLP	SUR	100	0	0	1.4	0.5	1.5
44912	52.6	-26.6	ALL	MSLP	SUR	61	4	7	2.8	1.7	3.3
44925	60.9	-53.1	ALL	MSLP	SUR	57	1	2	3.5	2.0	4.1
49712	37.0	-13.8	ALL	MSLP	SUR	4	0	0	0.6	0.0	0.7
62552	57.2	-10.9	ALL	MSLP	SUR	879	2	0	1.7	-0.3	1.8
62553	50.8	-23.9	ALL	MSLP	SUR	741	3	0	1.9	0.0	1.9
62554	54.8	-13.4	ALL	MSLP	SUR	797	0	0	1.7	0.3	1.7
62555	44.6	-14.1	ALL	MSLP	SUR	1081	5	0	1.4	-0.2	1.4
62556	48.8	-24.6	ALL	MSLP	SUR	1254	2	0	1.8	0.0	1.8
62557	46.2	-21.7	ALL	MSLP	SUR	1150	7	1	1.8	0.0	1.8
62558	52.1	-18.5	ALL	MSLP	SUR	1172	1	0	1.6	0.4	1.7
62570	44.5	-13.1	ALL	MSLP	SUR	13	0	0	0.6	0.6	0.9
62673	58.4	-37.2	ALL	MSLP	SUR	234	84	36	1.3	-0.3	1.4
62674	58.4	-27.8	ALL	MSLP	SUR	229	85	37	1.5	-0.2	1.5
62697	49.3	-21.9	ALL	MSLP	SUR	883	7	1	1.8	-0.2	1.8
62927	52.8	-20.1	ALL	MSLP	SUR	33	0	0	1.5	0.5	1.6
62929	55.3	-35.6	ALL	MSLP	SUR	43	0	0	2.6	2.4	3.6
64528	58.5	-33.1	ALL	MSLP	SUR	1954	3	0	1.6	-0.3	1.6
64530	64.1	-35.6	ALL	MSLP	SUR	935	2	0	2.3	0.7	2.4

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
64552	61.9	-28.1	ALL	MSLP	SUR	629	3	0	2.2	0.8	2.3
64561	52.1	-36.8	ALL	MSLP	SUR	975	3	0	1.8	0.0	1.8
64563	56.7	-52.2	ALL	MSLP	SUR	1727	3	0	1.9	-0.3	2.0
65591	61.6	-40.1	ALL	MSLP	SUR	574	6	1	1.8	-0.1	1.8
65592	62.5	-36.6	ALL	MSLP	SUR	1347	72	5	3.4	-0.9	3.6
65594	62.9	-24.5	ALL	MSLP	SUR	2273	6	0	1.7	0.2	1.7
65596	50.0	-40.3	ALL	MSLP	SUR	326	20	6	2.3	-1.2	2.6
65597	55.0	-47.9	ALL	MSLP	SUR	1576	1	0	1.5	-0.1	1.5
WIND SPEED											
09712	20.9	-23.6	ALL	SPEED	SUR	3	0	0	2.4	3.1	4.0
39712	25.2	-73.6	ALL	SPEED	SUR	18	0	0	4.3	3.6	5.6
41505	20.2	-55.5	ALL	SPEED	SUR	250	17	7	6.5	1.9	6.8
41506	15.9	-54.0	ALL	SPEED	SUR	231	1	0	2.4	0.5	2.4
41522	11.4	-48.4	ALL	SPEED	SUR	182	0	0	1.3	0.1	1.3
41523	13.6	-52.6	ALL	SPEED	SUR	224	0	0	1.5	0.4	1.6
41524	14.4	-54.6	ALL	SPEED	SUR	239	0	0	1.4	0.5	1.5
41525	13.1	-41.4	ALL	SPEED	SUR	207	0	0	1.4	0.7	1.6
42552	57.0	-10.6	ALL	SPEED	SUR	1	0	0	0.0	-1.5	1.5
44609	52.9	-40.7	ALL	SPEED	SUR	465	95	20	6.3	2.2	6.7
44610	45.2	-48.6	ALL	SPEED	SUR	251	4	2	3.9	2.9	4.9
44621	53.6	-30.4	ALL	SPEED	SUR	361	5	1	3.0	-0.1	3.0
44624	60.9	-13.5	ALL	SPEED	SUR	838	1	0	2.7	-2.1	3.4
44742	39.5	-14.9	ALL	SPEED	SUR	551	0	0	2.2	-0.9	2.4
44762	38.1	-13.1	ALL	SPEED	SUR	422	1	0	1.9	-0.7	2.0
44773	60.4	-31.6	ALL	SPEED	SUR	1399	3	0	2.7	-1.0	2.9
49712	37.0	-13.8	ALL	SPEED	SUR	4	0	0	3.2	3.1	4.4
62552	57.2	-10.9	ALL	SPEED	SUR	858	0	0	1.8	-0.8	2.0
62553	50.8	-23.9	ALL	SPEED	SUR	731	0	0	2.4	-1.2	2.6
62557	46.2	-21.7	ALL	SPEED	SUR	2	2	100	0.0	0.0	0.0
62558	52.1	-18.5	ALL	SPEED	SUR	1	1	100	0.0	0.0	0.0
62559	43.6	-15.6	ALL	SPEED	SUR	34	0	0	0.8	-0.5	0.9
62562	49.6	-17.6	ALL	SPEED	SUR	53	0	0	4.8	-2.0	5.2
62565	53.1	-14.3	ALL	SPEED	SUR	59	0	0	1.8	1.0	2.1
62566	42.7	-15.5	ALL	SPEED	SUR	22	0	0	0.6	-0.4	0.7
62567	46.6	-13.0	ALL	SPEED	SUR	570	0	0	1.8	-0.4	1.8
62569	45.1	-12.6	ALL	SPEED	SUR	47	0	0	1.1	1.4	1.8
62673	58.4	-37.2	ALL	SPEED	SUR	16	0	0	4.0	-15.7	16.2
62674	58.4	-27.8	ALL	SPEED	SUR	16	0	0	3.5	-14.7	15.2
62697	49.3	-21.9	ALL	SPEED	SUR	1	1	100	0.0	0.0	0.0
WIND DIRECTION											
09712	20.9	-23.6	ALL	DIRN.	SUR	3	0	0	13.6	4.6	14.3
39712	25.2	-73.6	ALL	DIRN.	SUR	15	0	0	28.7	-0.8	28.7
41505	20.2	-55.5	ALL	DIRN.	SUR	193	17	9	27.8	2.5	27.9
41506	15.9	-54.0	ALL	DIRN.	SUR	222	1	0	21.5	13.1	25.1
41522	11.4	-48.4	ALL	DIRN.	SUR	182	0	0	12.6	6.7	14.3
41523	13.6	-52.6	ALL	DIRN.	SUR	221	0	0	13.9	-4.4	14.6
41524	14.4	-54.6	ALL	DIRN.	SUR	239	0	0	20.5	-9.4	22.5
41525	13.1	-41.4	ALL	DIRN.	SUR	207	0	0	12.9	-10.4	16.6
42552	57.0	-10.6	ALL	DIRN.	SUR	1	0	0	0.0	-7.7	7.7
44609	52.9	-40.7	ALL	DIRN.	SUR	457	95	21	38.0	-1.2	38.1
44610	45.2	-48.6	ALL	DIRN.	SUR	243	4	2	28.0	-7.6	29.0
44621	53.6	-30.4	ALL	DIRN.	SUR	343	5	1	30.6	0.3	30.6
44624	60.9	-13.5	ALL	DIRN.	SUR	698	1	0	19.6	5.0	20.3
44742	39.5	-14.9	ALL	DIRN.	SUR	488	0	0	19.4	-6.6	20.5
44762	38.1	-13.1	ALL	DIRN.	SUR	343	1	0	20.7	0.2	20.7
44773	60.4	-31.6	ALL	DIRN.	SUR	1290	3	0	27.3	0.4	27.3
49712	37.0	-13.8	ALL	DIRN.	SUR	3	0	0	77.9	56.6	96.3
62552	57.2	-10.9	ALL	DIRN.	SUR	799	0	0	16.5	1.1	16.5
62553	50.8	-23.9	ALL	DIRN.	SUR	704	0	0	19.7	1.5	19.7
62557	46.2	-21.7	ALL	DIRN.	SUR	2	2	100	0.0	0.0	0.0

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
WIND DIRECTION											
62558	52.1	-18.5	ALL	DIRN.	SUR	1	1	100	0.0	0.0	0.0
62559	43.6	-15.6	ALL	DIRN.	SUR	27	0	0	10.0	2.8	10.3
62562	49.6	-17.6	ALL	DIRN.	SUR	46	0	0	70.1	-22.6	73.6
62565	53.1	-14.3	ALL	DIRN.	SUR	57	0	0	13.5	4.1	14.2
62566	42.7	-15.5	ALL	DIRN.	SUR	22	0	0	10.5	-3.3	11.0
62567	46.6	-13.0	ALL	DIRN.	SUR	540	0	0	14.6	6.2	15.8
62569	45.1	-12.6	ALL	DIRN.	SUR	47	0	0	15.5	12.2	19.7
62673	58.4	-37.2	ALL	DIRN.	SUR	16	0	0	8.5	20.7	22.4
62674	58.4	-27.8	ALL	DIRN.	SUR	16	0	0	29.1	8.9	30.4
62697	49.3	-21.9	ALL	DIRN.	SUR	1	1	100	0.0	0.0	0.0

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: December, 1997

Monitoring procedures:
Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :40°N - 70°N, 60°W - 0°W.

Standard of comparison :Background field from Bracknell global model.

Observation times :All hours combined.

Level(s) monitored :300.0 - 150.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

:N REP.	:Number of observations received excluding duplicates.
:PG	:Percentage of observations with gross errors.
:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
:PC	:Percentage of observations with calm winds.
:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP ≥ 20

NB: US ACARs and ADS data are shown at the bottom of the table as US ACAR and ADS respectively.

		TEMPERATURE					WIND				
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	3367	0	2	1.8	0.2	3380	0	3	0	9.0	1.0
ACA	1148	1	2	1.7	0.0	1174	0	2	0	8.0	0.7
AEA	319	1	100	3.2	1.4	313	0	14	0	11.2	1.8
AEL	326	0	30	1.9	-0.3	334	1	5	0	10.4	1.5
AEY	29	0	0	2.0	0.8	29	0	0	0	11.6	1.9
AFL	334	1	4	1.8	0.1	334	0	4	0	9.0	0.9
AFR	1215	0	12	1.8	0.2	1234	0	13	0	9.1	1.2
AIH	152	1	6	1.8	0.3	151	0	8	0	8.8	1.8
AJM	64	2	3	1.6	0.0	61	2	3	0	9.0	2.1
AMX	229	1	3	2.0	0.0	230	0	4	0	9.4	1.5
ANZ	234	0	2	2.0	-1.1	234	0	2	0	7.5	0.4
AOM	279	2	6	2.0	0.8	296	0	7	0	12.4	1.3
AUA	26	4	8	2.1	-1.2	27	0	0	0	8.9	-0.1
AVA	136	1	5	2.3	0.4	144	0	6	0	11.3	2.1
AZA	241	1	6	1.8	0.6	240	0	6	0	10.8	0.2
BAL	382	0	14	1.9	-0.2	387	1	15	0	9.0	1.1
BAW	1330	1	8	1.9	0.2	1345	0	8	0	7.9	1.2
BBB	23	0	0	1.6	0.3	22	0	5	0	8.8	0.3
BWA	83	1	100	4.0	2.8	94	2	11	0	14.3	1.1
CDN	558	1	1	1.9	1.1	560	0	2	0	7.9	1.3
CFG	652	0	2	2.0	-0.6	666	0	3	0	10.2	1.2
CKT	90	0	10	2.4	0.3	91	0	13	0	13.4	1.1
CLX	265	1	2	1.7	-0.4	270	0	3	0	8.4	0.8
CMM	69	0	1	1.5	0.0	67	1	3	0	9.3	0.9
COA	915	1	3	1.9	0.5	922	0	7	0	12.3	3.4
CRL	184	2	4	1.8	0.6	193	1	3	0	9.7	2.1
CSA	21	0	5	1.8	-0.4	22	0	14	5	15.6	-4.0
CTB	155	1	2	1.4	0.3	157	1	4	0	9.9	1.6
CTM	24	4	17	2.8	-1.8	24	0	13	0	9.4	3.2
CUB	260	0	5	2.5	1.4	269	0	80	0	11.9	2.0
DAF	25	4	4	3.0	-0.2	25	0	0	0	7.1	1.2
DAL	2377	0	2	1.9	-0.1	2398	0	3	0	9.3	0.8
DBY	95	0	1	1.3	-0.1	101	1	5	0	9.1	1.8
DHL	180	1	100	3.5	-2.1	178	0	100	1	10.2	1.3
DLH	2362	0	8	1.8	0.4	2366	0	11	2	8.0	0.8
DOA	21	0	5	1.6	-0.8	22	0	5	0	13.4	1.5
EIA	47	0	0	1.6	0.5	47	0	40	0	19.7	10.3
EIN	20	0	20	2.3	1.0	20	0	60	0	24.3	15.6
ELY	111	2	6	2.0	0.1	112	1	10	0	8.8	-0.6
EWW	103	5	100	2.5	0.4	103	0	100	0	13.1	2.0
FDX	408	0	1	1.8	0.4	412	0	1	0	8.4	1.4
FIN	370	1	4	1.6	0.5	368	0	5	0	9.8	1.3
GAF	36	0	0	1.8	-0.9	37	0	3	0	9.1	1.0
HLF	108	0	0	1.9	-0.5	110	1	5	0	10.9	-0.8
IBE	817	1	18	2.2	0.6	821	0	19	0	11.1	1.6
ICE	720	0	1	1.5	0.1	717	0	1	0	7.5	0.8
IRL	29	0	3	2.8	2.1	29	0	0	0	6.2	-0.1
JAL	20	0	0	1.1	0.7	20	0	0	0	6.3	1.3
KLM	2463	0	2	1.9	0.3	2497	0	3	0	8.8	0.9
LDA	200	1	23	1.9	-0.7	211	1	24	0	9.3	2.0
LDI	310	0	39	1.6	0.1	318	0	20	0	10.7	2.1
LEI	170	0	1	1.9	0.8	169	0	4	0	9.3	0.9
LIB	115	3	4	2.3	1.1	122	0	7	0	13.6	1.5
LKR	36	0	3	1.3	0.6	36	0	3	0	9.4	1.1
LOT	180	0	2	1.9	-1.1	181	0	2	0	6.6	0.5
LTU	546	1	5	1.8	0.2	548	0	5	0	9.0	0.9
MON	28	4	18	1.6	0.0	30	0	17	0	10.3	0.7
MPD	66	0	5	2.3	0.9	65	2	5	0	9.6	2.0
MPH	770	0	2	1.8	-0.5	799	0	4	0	9.1	0.9

		TEMPERATURE				WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
NCA	22	0	5	1.2	0.0	22	0	9	0	7.7	1.5
NWA	2284	1	2	2.1	1.0	2341	0	2	0	8.9	1.0
OAL	21	0	0	2.7	1.9	21	0	5	0	9.6	1.6
PAC	45	0	18	1.6	1.1	45	0	22	0	12.9	3.0
RAM	49	0	4	2.5	-1.0	48	0	2	0	11.7	3.9
RCH	108	9	100	2.5	0.8	104	0	100	0	13.9	2.7
RJA	56	4	5	1.8	1.0	56	0	2	0	8.3	0.4
ROY	39	0	3	1.4	0.5	39	0	5	0	7.9	0.9
RRR	33	3	27	2.3	0.3	33	0	27	0	13.8	-1.1
SAB	24	0	0	1.2	-0.5	24	0	0	0	6.8	1.5
SAS	934	0	1	1.7	0.1	937	0	2	0	8.2	0.8
SIA	119	1	4	1.9	-0.9	123	0	7	0	8.7	1.0
SLR	71	3	25	1.9	-0.1	73	0	25	0	15.1	3.0
SPP	146	1	3	1.7	-0.2	149	0	5	0	10.9	2.5
SVA	144	0	3	1.8	0.5	150	0	100	0	14.1	3.3
SWR	170	1	4	1.8	0.2	171	0	4	0	7.9	0.8
TAP	280	1	3	1.8	0.1	272	0	7	0	11.2	1.1
TOW	91	1	4	1.6	-0.4	93	0	5	0	7.3	0.0
TWA	1330	1	3	2.1	0.3	1354	0	2	0	9.2	1.3
UAL	1883	0	2	1.9	-0.2	1903	0	2	0	7.6	0.8
UNS	184	0	80	1.5	0.7	184	0	81	0	8.6	1.6
UPS	300	2	18	1.8	0.2	307	0	18	0	8.7	1.5
USA	293	0	1	1.8	0.2	298	0	2	0	9.3	1.0
VIR	272	1	2	1.8	-0.3	274	0	2	0	7.6	0.8
VKG	62	2	3	2.1	1.1	62	0	8	0	12.5	0.7
WOA	27	0	11	1.6	1.1	27	0	11	0	7.3	1.3
BA	5799	0	0	1.4	0.3	5800	0	0	0	7.5	1.3
KL	4253	0	0	1.6	0.7	4253	0	1	0	7.7	0.9
LH	561	0	1	1.4	0.2	561	0	1	0	8.0	1.9
N	262	1	3	2.4	0.2	265	0	3	0	8.3	0.4
ADS	230	0	1	1.3	0.0	230	0	12	0	5.6	0.7
US ACAR	11137	0	0	1.5	0.2	11136	0	0	0	7.8	1.0

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: December, 1997

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DBBH	12	Z	100	10	0	32.0	42.1	27.3
FNOR	00	Z	100	15	0	11.9	22.8	19.5
FNOR	12	Z	100	13	0	11.6	27.3	24.7
FNOU	00	Z	100	7	0	7.2	18.6	17.1
FNOU	12	Z	100	6	0	5.2	21.3	20.7
FNPH	00	Z	100	11	0	16.9	21.9	14.0
FNPH	12	Z	100	14	0	19.3	28.3	20.7
FNRS	00	Z	100	13	0	19.8	21.3	7.7
FNRS	12	Z	100	13	0	18.8	25.5	17.2
FVRS	00	Z	100	1	0	0.0	12.0	12.0
JCCX	00	Z	100	1	0	0.0	37.0	37.0
JDWX	00	Z	100	1	0	0.0	56.0	56.0
LDWR	00	Z	100	29	0	13.3	13.9	-4.0
LDWR	12	Z	100	29	0	17.8	17.8	-1.1
OXVH2	00	Z	100	14	0	11.0	14.8	-9.8
OXVH2	12	Z	100	14	0	19.4	26.3	-17.7
OXYH2	00	Z	100	11	0	13.6	14.2	4.1
OXYH2	12	Z	100	11	0	16.4	18.7	8.9
SHIPS	00	Z	100	1	0	0.0	19.0	19.0
V2VM	00	Z	100	14	0	12.1	13.0	-4.6
V2VM	12	Z	100	13	0	30.7	30.7	1.5
V2XM	00	Z	100	12	0	17.4	23.4	15.6
V2XM	12	Z	100	10	0	18.2	24.9	17.0
03953	00	Z	100	30	0	15.7	15.9	2.9
03953	12	Z	100	28	0	17.5	18.8	6.7
04018	00	Z	100	28	0	19.6	21.0	7.5
04018	12	Z	100	26	0	13.9	15.6	6.9
04220	00	Z	100	28	0	14.6	23.9	19.0
04220	12	Z	100	29	0	11.1	26.7	24.3
04270	00	Z	100	28	0	15.7	17.3	7.3
04270	12	Z	100	28	0	11.1	14.8	9.8
04339	00	Z	100	27	0	13.2	18.5	13.0
04339	12	Z	100	27	0	12.8	20.2	15.6
04360	00	Z	100	26	0	14.2	20.8	15.2
04360	12	Z	100	26	0	15.3	19.9	12.7
08001	00	Z	100	24	1	23.4	23.5	1.5
08001	12	Z	100	24	0	16.3	16.7	3.3
08508	00	Z	100	30	0	20.6	23.7	11.7
08508	12	Z	100	30	0	19.6	27.0	18.6
08522	00	Z	100	1	0	0.0	7.0	7.0
08522	12	Z	100	12	0	13.6	21.9	17.2
60020	00	Z	100	27	0	10.7	15.9	11.7
60020	12	Z	100	27	0	19.4	21.3	8.8
71600	00	Z	100	29	0	14.8	20.7	14.5
71600	12	Z	100	30	0	14.4	20.0	13.9
72201	00	Z	100	26	0	17.2	20.1	10.5
72201	12	Z	100	29	0	12.1	14.1	7.2
72402	00	Z	100	25	0	22.4	26.6	14.3
72402	12	Z	100	26	0	29.6	29.9	4.0
74494	00	Z	100	24	0	14.9	15.0	-1.9
74494	12	Z	100	25	0	17.4	17.8	-4.0
78016	00	Z	100	1	0	0.0	28.0	28.0
78016	12	Z	100	27	0	18.2	20.7	9.9

TABLE 11

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: December, 1997

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DBBH	12	Z	500	14	0	12.1	19.9	15.9
FNOR	00	Z	500	15	0	12.2	19.0	14.6
FNOR	12	Z	500	16	0	10.1	19.0	16.1
FNOU	00	Z	500	7	0	13.8	23.2	18.7
FNOU	12	Z	500	7	0	12.3	22.7	19.1
FNPH	00	Z	500	13	0	15.2	15.4	3.0
FNPH	12	Z	500	15	0	13.9	15.8	7.6
FNRS	00	Z	500	14	0	8.2	12.7	9.7
FNRS	12	Z	500	15	0	14.3	17.5	10.1
FVRS	00	Z	500	1	0	0.0	11.0	-11.0
JCCX	00	Z	500	1	0	0.0	1.0	1.0
JDWX	00	Z	500	1	0	0.0	21.0	21.0
LDWR	00	Z	500	29	0	11.8	15.6	10.2
LDWR	12	Z	500	29	0	12.3	13.1	4.4
OXVH2	00	Z	500	15	0	11.7	13.3	6.3
OXVH2	12	Z	500	19	0	10.6	10.6	-0.3
OXYH2	00	Z	500	12	0	18.3	20.3	8.8
OXYH2	12	Z	500	12	0	21.1	21.2	1.7
SHIPS	00	Z	500	1	0	0.0	16.0	16.0
V2VM	00	Z	500	14	0	13.5	13.6	-1.1
V2VM	12	Z	500	14	0	17.8	18.5	-4.7
V2XM	00	Z	500	12	0	8.2	17.4	15.3
V2XM	12	Z	500	10	0	16.3	18.6	9.1
03953	00	Z	500	30	0	11.4	15.9	11.1
03953	12	Z	500	30	0	21.6	22.4	5.9
04018	00	Z	500	30	0	10.9	19.7	16.5
04018	12	Z	500	28	0	16.3	19.5	10.6
04220	00	Z	500	28	0	20.5	21.4	6.1
04220	12	Z	500	29	0	20.2	21.1	5.9
04270	00	Z	500	28	0	14.6	19.3	12.7
04270	12	Z	500	29	0	11.2	15.6	10.9
04339	00	Z	500	27	0	14.1	17.5	10.4
04339	12	Z	500	27	0	14.0	17.7	10.9
04360	00	Z	500	26	0	15.5	17.2	7.4
04360	12	Z	500	26	0	13.0	13.8	4.6
08001	00	Z	500	27	0	14.8	17.1	8.5
08001	12	Z	500	28	0	13.7	14.1	3.5
08508	00	Z	500	30	0	17.3	18.2	5.9
08508	12	Z	500	30	0	16.1	19.6	11.1
08522	00	Z	500	1	0	0.0	8.0	8.0
08522	12	Z	500	12	0	12.5	24.0	20.5
60020	00	Z	500	27	0	9.1	18.4	16.0
60020	12	Z	500	27	0	13.2	23.1	19.0
71600	00	Z	500	29	0	16.6	17.9	6.7
71600	12	Z	500	30	0	12.4	12.8	3.2
72201	00	Z	500	27	0	8.9	12.3	8.4
72201	12	Z	500	30	0	9.7	10.5	4.0
72402	00	Z	500	27	0	14.5	15.3	5.1
72402	12	Z	500	28	0	18.5	20.1	-7.9
74494	00	Z	500	28	0	14.4	14.7	3.1
74494	12	Z	500	30	0	11.8	12.5	-4.1
78016	00	Z	500	1	0	0.0	18.0	18.0
78016	12	Z	500	26	0	11.1	17.2	13.2

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: December, 1997

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:VECTOR WIND in $m\ s^{-1}$
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBBH	12	V	100	9	0	0	5.5	0.8	2.2
FNOR	00	V	100	13	0	0	3.2	0.8	1.2
FNOR	12	V	100	12	0	0	2.7	1.6	-0.1
FNOU	00	V	100	6	0	0	4.7	1.3	0.0
FNOU	12	V	100	6	0	0	4.7	1.0	-0.7
FNPH	00	V	100	9	0	0	4.7	-0.9	0.8
FNPH	12	V	100	12	0	0	2.1	-1.0	-0.1
FNRS	00	V	100	9	0	0	4.4	0.4	1.4
FNRS	12	V	100	5	0	0	4.1	-1.3	-0.4
FVRS	00	V	100	1	0	0	4.1	3.1	5.9
JCCX	00	V	100	1	0	0	4.1	-1.2	4.0
JDWX	00	V	100	1	0	0	4.1	-0.4	-1.1
LDWR	00	V	100	29	0	0	4.1	-1.1	-0.2
LDWR	12	V	100	29	0	0	2.5	-1.1	-1.2
OXVH2	00	V	100	12	0	0	1.9	-0.7	-0.3
OXVH2	12	V	100	13	0	0	2.7	-0.9	-0.4
OXYH2	00	V	100	11	0	0	1.7	-0.5	1.5
OXYH2	12	V	100	10	0	0	2.3	-0.4	1.2
V2VM	00	V	100	13	0	0	1.8	0.3	0.4
V2VM	12	V	100	12	0	0	3.4	-0.1	0.5
V2XM	00	V	100	4	0	0	5.9	0.3	2.3
V2XM	12	V	100	5	0	0	5.9	-1.2	0.9
03953	00	V	100	28	0	0	2.5	-0.7	-0.8
03953	12	V	100	26	0	0	2.3	-0.6	0.6
04018	00	V	100	22	0	0	2.6	-0.2	-0.8
04018	12	V	100	23	0	0	2.9	-0.1	0.2
04220	00	V	100	25	0	4	2.3	-0.2	1.6
04220	12	V	100	26	0	0	4.2	-0.9	1.6
04270	00	V	100	25	0	4	2.1	-1.5	0.6
04270	12	V	100	26	0	0	5.4	-0.5	1.0
04339	00	V	100	25	0	0	3.3	-1.3	1.1
04339	12	V	100	26	0	0	3.6	0.2	0.2
04360	00	V	100	23	0	0	4.2	-0.5	0.1
04360	12	V	100	23	0	0	2.8	-0.1	0.8
08001	00	V	100	21	0	0	4.5	-0.7	0.8
08001	12	V	100	21	0	0	3.7	-1.8	-0.4
08508	00	V	100	24	0	0	4.3	-0.6	-0.2
08508	12	V	100	25	0	0	3.5	-1.1	-1.9
60020	00	V	100	24	0	0	4.5	1.8	0.1
60020	12	V	100	26	0	0	4.3	0.0	1.0
71600	00	V	100	28	0	0	6.6	1.1	-0.4
71600	12	V	100	30	0	0	3.8	1.4	1.8
72201	00	V	100	24	0	0	4.7	0.5	1.5
72201	12	V	100	25	0	0	4.6	1.2	1.0
72402	00	V	100	23	0	0	2.4	0.9	0.6
72402	12	V	100	26	0	0	3.7	-0.8	-1.3
74494	00	V	100	20	0	0	3.4	-0.1	1.3
74494	12	V	100	22	0	0	2.0	-1.1	1.6
78016	00	V	100	1	0	0	5.3	-2.3	-3.9
78016	12	V	100	25	0	0	5.3	-1.9	0.1

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: December, 1997

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS:	Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

```
 WMO    OBS                NUM    NUM      %
IDENT  TIME  ELM   LEV    OBS   GROSS    REJ     RMS    UBIAS   VBIAS

DBBH    12    V    500    14      0       0      4.7    -1.0     0.2
FNOR    00    V    500    13      0       0      5.8    -0.6     0.2
FNOR    12    V    500    13      0       0      3.4    -0.7     2.5
FNOU    00    V    500     6      0       0      4.3    -1.0    -3.1
FNOU    12    V    500     6      0       0      4.3    -2.0     1.6

FNPH    00    V    500    11      0       0      4.3    -0.5     0.1
FNPH    12    V    500    13      0       0      4.0    -0.5     0.3
FNRS    00    V    500    11      0       0      3.3     0.1     1.8
FNRS    12    V    500     8      0       0      4.0    -1.3     4.1
JCCX    00    V    500     1      0       0      4.0     0.0    -0.9

JDWX    00    V    500     1      0       0      4.0    -0.9     0.9
LDWR    00    V    500    29      0       0      4.0     1.7    -1.2
LDWR    12    V    500    29      0       3      3.0    -1.2    -0.1
OXVH2   00    V    500    10      0       0      4.1    -1.2     0.4
OXVH2   12    V    500    18      0       0      3.6     0.6    -0.4

OXYH2   00    V    500    12      0       0      4.0    -0.7     0.0
OXYH2   12    V    500    12      0       0      4.0     0.6    -0.3
V2VM    00    V    500    12      0       0      3.3    -1.8    -1.9
V2VM    12    V    500    13      0       0      3.3    -0.1     0.7
V2XM    00    V    500     5      0       0      4.4     1.5    -1.5

V2XM    12    V    500     6      0       0      4.4    -0.1    -1.5
03953   00    V    500    30      0       3      3.4     0.5     0.7
03953   12    V    500    29      0       0      4.9     0.2    -0.1
04018   00    V    500    26      0       0      3.7     0.9    -0.9
04018   12    V    500    23      0       4      2.9    -0.2     1.5

04220   00    V    500    26      0       0      5.0     0.2    -1.6
04220   12    V    500    27      0       0      3.0    -0.4     1.2
04270   00    V    500    28      0       3      4.8     0.8     0.2
04270   12    V    500    26      0       0      5.1     1.8    -0.3
04339   00    V    500    26      0       3      3.5     0.9    -1.6

04339   12    V    500    27      0       0      4.1     1.9    -0.6
04360   00    V    500    25      0       0      4.9    -0.2    -0.4
04360   12    V    500    24      0       0      4.4     1.1     0.3
08001   00    V    500    25      0       0      5.4     0.3    -2.2
08001   12    V    500    27      0       0      3.7     0.7    -1.7

08508   00    V    500    24      0       4      3.5     0.0    -1.0
08508   12    V    500    26      0       0      6.1    -1.6    -1.0
60020   00    V    500    26      0       0      3.3    -0.5     0.8
60020   12    V    500    27      0       0      3.6    -0.5    -1.3
71600   00    V    500    28      0       0     10.8     1.4    -0.3

71600   12    V    500    30      0       3      5.0    -0.2     0.6
72201   00    V    500    25      0       0      4.2    -0.2     0.6
72201   12    V    500    30      0       0      2.6     0.0     2.1
72402   00    V    500    26      0       0      5.7     0.7     0.4
72402   12    V    500    28      0       0      3.5     0.6     0.6

74494   00    V    500    28      0       0      8.5    -0.4     0.6
74494   12    V    500    30      0       0      2.6    -0.2     1.3
78016   00    V    500     1      0       0      6.1    -0.6    -1.1
78016   12    V    500    26      0       0      6.1     0.8     1.3
```

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed m s^{-1}
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45